The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 130, NO. 1 — CHICAGO, ILLINOIS — JANUARY 5, 1946

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PROTECTIVE SKIN COATINGS FOR THE PREVENTION OF SUNBURN

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In December 1942 the Council on Pharmacy and Chemistry was approached by Col. Otis O. Benson Jr., M. C., representing the commanding general, Army Air Forces, Matériel Center, Wright Field, Dayton, Ohio, in regard to the most effective protective substance for the prophylaxis of sunburn. The problem was as follows:

The Matériel Center would like information on the most effective protective substance for the prophylaxis of sunburn. In essence, the problem is as follows:

(*a*) Men marooned on life rafts or in the desert following airplane crashes for various reasons seem to lose a good deal of their clothing and are subject to severe solar exposure.

(*b*) It has been definitely established that a protective substance (cream or ointment) to be stowed in life rafts and other emergency equipment in military aircraft is required, when the aircraft is operating in the southwest Pacific and Mediterranean theaters.

(*c*) The requirement per seven-man life raft has been tentatively set at enough protective ointment to make four applications to at least 25 per cent of the body surface, for nine men. Perhaps it might be better to consider four applications to 25 per cent of the body surface per man, with the necessity of including seven to nine such units in a large airplane.

The substance used must, of necessity, be nontoxic and might even, on the other hand, be either bacteriostatic or bactericidal. Further problems are:

(*a*) Maximum protection per unit weight and/or volume.

(*b*) Maximum skin coverage per unit weight and/or volume.

(*c*) Stability and freedom from rancidity of the substance to be used.

(*d*) This substance should lend itself to simple packing, and if freezing were to occur at high altitudes, the container should not burst.

(*e*) The protective substance is to be put up in suitable containers and stowed in life rafts, which, in turn, are in stowage compartments of the airplane and are jettisoned at the time of forced landing on water (or even in the desert).

It is specifically requested that this inquiry not be published in any form in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.[1]

Your cooperation and aid in this matter will be deeply appreciated.

From the Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, and from the Department of Dermatology and Syphilology and the Department of Pharmacology and Experimental Therapeutics of Western Reserve Medical School and of the University Hospitals.

1. Now that hostilities have ceased, the authors have been given permission to publish the results of their investigation.

It was decided to obtain the cooperation of the Lighting Research Laboratory of the General Electric Company, Nela Park, Cleveland. This laboratory, under the direction of Dr. Matthew Luckiesh, a world-wide authority on light and radiant energy, is ideally equipped to make quantitative spectral measurements and to elucidate any physical problems associated with compounds to be investigated. Unfortunately, in the past, the numerous preparations suggested for prevention of sunburn have been too often selected with little or no study or real attempt to see what the effect of the compound would be on the ultraviolet energy of various wavelengths that cause sunburn. Probably as serious an endeavor to answer this problem as can be found in the literature is the one by Bachem and Fantus.[2] They made spectroscopic studies of their individual compounds and then followed these up with limited biologic studies on the human body to analyze the protection of the preparations against exposure to the sun's rays. Their conclusions were that: 1. Wool fat, yellow petrolatum and diachylon ointment have the highest sun-screen value of the ointment bases tested. 2. Yellow petrolatum is superior to white petrolatum for protection against ultraviolet rays. 3. Titanium dioxide is the most efficient of the insoluble powders tested so far as sunscreen value is concerned. Calamine is also of value but is less efficient. 4. Ichthammol has a definite sun-screen value even in concentration as low as 2 per cent, and this may explain in part its therapeutic value. 5. Aesculin and menthyl salicylate are more efficient than is quinine oleate.

While this article was of definite value and gave some good leads, it did not present measurements of the absorption of energy of various wavelengths that cause sunburn. Spectroscopic studies may do this roughly, but a careful evaluation can be made only by quantitative measurements for various wavelengths of ultraviolet energy.

Erythema, or sunburn, as a result of exposure to natural sunlight is principally caused by ultraviolet energy in the spectral range 2,900 to 3,200 wavelengths. (These wavelengths are expressed in angstrom units.) Consequently any satisfactory protective cream should be highly absorbent in this spectral region. Another requirement is that the material shall not be easily washed off the skin.

Previous researches by Luckiesh and Taylor [3] show the relative effectiveness of certain lines of the mercury spectrum in the solar spectral region of special interest (table 1).

2. Bachem, Albert, and Fantus, Bernard: Evaluation of Skin Protection Against Ultraviolet Rays, Arch. Phys. Therapy **20**: 69-76 (Feb.) 1939.

3. Luckiesh, Matthew, and Taylor, A. H.: Erythemal and Tanning Effectiveness of Ultraviolet Energy, General Electric Review **42**: 274 (June) 1939.

In order to measure the spectral transmission of a thin film of specimens of protective material, a thin wedge was formed between quartz plates. In some cases it was quite difficult to obtain wedges free from air bubbles, which are more transparent than the test material. Heating the quartz plates before applying the material made it flow out better. Since some of these materials diffuse the transmitted energy, it was necessary to make the transmission measurements with fused quartz, ground on both sides, in front of the slit of the monochromator.

ARTICLES TESTED

After preliminary discussion with Dr. Luckiesh, it was decided to test out Harriett Hubbard Ayers' Sun Tan, titanium dioxide, phenyl salicylate, zinc oxide, petrolatum flavum U. S. P., amber petroleum jelly, petrolatum album U. S. P., unguentum zinci oxidi and Cuticolor titanium dioxide, which contains, in addition to the titanium dioxide, the ferric and ferrous oxides to add color to the compound.

For reference purposes these materials were assigned designation letters. The compositions of the various materials tested are given in table 2, and the transmissions of various thicknesses in table 3. Later, in view of the results with the several petrolatums, it was thought best to explore this angle more fully and through Mr. Trevor Holliday, president, Standard Oil of Ohio, the problem was taken up with Mr. F. H. Bedford Jr., Standard Oil of New Jersey, New York City. He forwarded for the study the following materials:

Specimen O. Extra light amber petrolatum, Parmo number 1736.

Specimen P. Amber Parmo (petrolatum U. S. P.) number 2356.

Specimen Q. Dark Red Vet. Petrolatum.

Specimen R. D and R sun lotion, containing menthyl salicylate.

Specimen X. U. M. BM = C Petrolatum. (This was a dark, heavy petrolatum, too stiff to be used on the skin and therefore not tested.)

In addition, on suggestion of Prof. Paul Hanzlik, pharmacology department, Stanford University Medical School, a trial was made of:

Specimen S. "Sunex" Ointment (Abbott Laboratories, Chicago), containing butesin, metaphen and oleic acid ester amide diethylamine in cold cream. Professor Hanzlik stated that this compound is used quite widely on the deserts and mountains on the Pacific coast, with good results. He also mentioned petrolatum. The transmission of ultraviolet energy of various wavelengths in the solar spectrum is presented in table 4 for specimens O, P, Q, R and S.

During the past seven years Luckiesh and Taylor have made many measurements of the ultraviolet in daylight in Cleveland, including a continuous integration of the erythemal ultraviolet energy. The maximum intensity measured in a four year period, occurring near noon, was equivalent in erythemal value to approximately 42 microwatts per square centimeter at wavelength 2,967.

In order to provide a greatly accelerated test of the protective creams, they used a clear-bulb type S-1 lamp without reflector. This source emits no appreciable energy shorter than wavelength 2,800. By means of quartz lenses, an image of the arc was projected onto a ¼ inch hole in a metal diaphragm. A quartz water-cell was placed in the optical path to absorb most of the heat in the beam. The energy passing through the hole was measured and found to be sixty times the erythemal value of the highest intensity of sunlight and skylight measured in the four year period. Thus one minute exposure to this source was equivalent

TABLE 1.—*Effectiveness of Mercury Spectrum*

Wavelengths	Relative Effectiveness in Producing Erythema and Tan
2,967	1.00
3,022	0.50
3,130	0.02
3,342	0.004
3,650	0.0012

TABLE 2.—*Composition of Sunburn Protective Materials*

Specimen A	Gm. or Cc.
Titanium dioxide	20.0
Liquid petrolatum	10.0
Wool fat anhydrous	11.5
Petrolatum flavum	36.5
Water	22.0
Specimen B	
Titanium dioxide	15.0
Phenyl salicylate	5.0
Liquid petrolatum	10.0
Wool fat anhydrous	11.5
Petrolatum flavum	36.5
Water	22.0
Specimen C	
Titanium dioxide	8.8
Glycerin	1.5
Vanishing cream	23.0
Specimen D	
Phenyl salicylate	3.0
Zinc oxide	10.0
Petrolatum flavum, q. s.	30.0
Specimen E	
Zinc oxide	10.0
Petrolatum flavum, q. s.	30.0
Specimen F	
Phenyl salicylate	3.0
Unguentum zinci oxidi	30.0

Specimen G	Gm. or Cc.
Cuticolor titanium dioxide	15.0
Liquid petrolatum	10.0
Wool fat anhydrous	12.5
Petrolatum (yellow)	37.5
Stronger rose water	25.0
Specimen H	
Petrolatum flavum	15.0
Specimen J	
Phenyl salicylate	1.5
Petrolatum flavum, q. s.	15.0
Specimen K	
Titanium dioxide	3.0
Petrolatum flavum, q. s.	15.0
Specimen L	
Phenyl salicylate	3.0
Zinc oxide	4.5
Petrolatum flavum	30.0
Specimen M	
Amber petrolatum jelly	
Specimen N	
White petrolatum jelly	

TABLE 3.—*Spectral Transmission of Skin Protective Preparations*

Specimen	Thickness in Mm.	Per Cent Transmission at Indicated Wavelengths				
		2,967	3,022	3,130	3,342	3,650
A	0.06	0.48	0.57	0.99	2.1	4.1
B	0.06	0.02	0.03	0.06	0.28	2.7
D	0.03	0	0	0	0.8	3.0
E	0.03	2.2	3.0	5.0	7.8	8.5
	0.06	0.18	0.3	0.75	2.2	2.4
F	0.12	—	—	—	—	0.05
G	0.07	—	—	0.23	0.89	2.8
H	0.03	21	27	38	—	—
	0.06	3.7	6.9	16	—	—
J*	0.03	1.8	1.6	1.1	9.7	25
	0.06	<0.1	<0.1	<0.1	0.3	6.5
	0.03	0	0	0	2.6	29
	0.03	6.8	5.9	5.1	18	35
	0.03	1.5	0.8	0.4	11	40
K	0.03	15	19	30	47	64
	0.06	4.2	6.8	13	—	—
	0.10	0.02	0.1	0.5	5.1	10
L	0.03	0.02	0.04	0.1	6	44
	0.06	0	0	0	0	0.3
M	0.03	5.0	8.6	21	52	75
	0.06	0.34	0.75	5.1	25	58
	0.10	0.03	0.04	0.18	4.9	24
N	0.03	65	69	71	88	91

* Four different specimens from same lot. Variations apparently due to nonuniformity of mixture of the two ingredients.

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to one hour of the most intense sunlight in Cleveland in a four year period. This was computed to be sufficient to produce a minimum perceptible erythema on average untanned skin in approximately eight seconds. The unprotected untanned skin of several subjects was exposed for fifteen seconds each to this intensity, and all developed some erythema from the exposure, most of them appreciably more than the minimum perceptible, thus confirming the energy measurement.

To provide the maximum protection it is desirable to have the protective coating so opaque to the erythemal region of the spectrum that a thin coating will give complete protection over many hours of continuous exposure. Most of our erythemal tests have been made with thin coatings, though some tests were made with thicker coatings, all on the upper arms of the subjects. Some detailed results of these tests are presented in table 5.

The terms "thin coating" and "thick coating" are rather indefinite as descriptive of the thickness of these creams, but the former indicates a coating which has been rubbed out quite well, corresponding to the thinnest coating which is likely to be applied.

WASHING EXPERIMENTS

Specimen C (titanium dioxide, glycerin and vanishing cream) and F (phenyl salicylate 10 per cent in unguentum zinci oxidi) wash off readily, and these are not suitable for the purposes desired. Harriett Hubbard Ayers' Sun Cream easily washes off the skin. Likewise R (D and R sun lotion) furnished by the Standard Oil Company of New Jersey, containing menthyl salicylate, is found to be easily removed from the skin by slopping water over it.

TABLE 4.—*Percentages of Ultraviolet Energy of Various Wavelengths Transmitted by Four Specimens of Petrolatum and Sunex Ointment*

Specimen	Thickness, Mm.	Per Cent Transmission at Wavelengths				
		2,967	3,022	3,130	3,342	3,650
O	0.03	32	32	55	88	94
P	0.03	25	30	44	74	89
Q	0.03	0	0	1.8	16	58
R	0.03	13	16	23	56	71
S	0.04	26	31	43	—	—

All other preparations adhere well to the skin after water has been repeatedly slopped over them, and Q (dark red vet. petrolatum) adheres most tenaciously to the skin and is hardly removed with soap and hot water and scrubbing.

FREEZING EXPERIMENTS

It was not found feasible to test the various compounds at very low temperatures, but they were all placed in the freezing compartment of a refrigerator at — 3 F. for four days.

Specimens A and G contained titanium dioxide, liquid petrolatum, anhydrous wool fat, petrolatum flavum and water, and C contained in addition phenyl salicylate.

Microscopically before freezing they showed a rather uniform picture. After four days in the freezing compartment of the refrigerator the collapsible full tubes were covered with hoar frost and were stiff, and only after some twenty minutes at room temperature was it possible to express some of the contents for examination. Microscopically, with both low and high power, the field showed the uniform picture to have disappeared

TABLE 5.—*Results of Erythemal Exposures to Determine Protective Qualities of Various Preparations*

Ultraviolet intensity of source equivalent to sixty times the most intense sunlight measured in Cleveland over a period of four years. One minute exposure to this source is equivalent to one hour of the most intense sunlight referred to, and about two hours of average midsummer noon sunlight in Cleveland.

Subjects B and H

No cream, 15 seconds' exposure, well above minimum perceptible erythema (MPE).
Cream A, thin coat, 15 minutes, very strong erythema.
Cream B, thin coat, 15 minutes, mild erythema.
No cream, 30 seconds, strong erythema but less than cream A with exposure of 15 minutes.

Subject F

No cream, 15 seconds, well above MPE.
Cream B, thin coating, 15 minutes, very strong erythema.
Cream B, heavy coating, 20 minutes, no erythema except at edge of spot exposed, where cream was apparently scraped very thin against diaphragm.
Cream D, thin coating, 15 minutes stronger than 15 second exposure without cream, slightly less than 30 second exposure without cream.
No cream, 30 seconds, strong erythema but less than cream B exposed 15 minutes.

Subject H

No cream, 15 seconds, moderate erythema, probably at least double or treble MPE
Cream G, thin coating, 15 minutes, erythema more than 30 second exposure without cream.
"Sun Cream," Harriett Hubbard Ayres' preparation, thin coating, 15 minutes, about same as 15 second exposure without cream.
No cream, 30 seconds, very strong erythema.

Subject W

No cream, 15 seconds, moderate erythema, approximately double MPE.
Cream B, thin coating, 15 minutes, about same as 30 second exposure without cream.
Cream E, thin coating, 15 minutes, somewhat stronger erythema than 30 second exposure without cream.
No cream, 30 seconds, strong erythema.

Subject M

No cream, 15 seconds, MPE.
Cream J, thin coating, 15 minutes, erythema only at one edge of exposed spot, probably due to cream being scraped off by edge of diaphragm.
Cream J, thick coat, 20 minutes, no erythema.
No cream, 30 seconds, strong erythema.

Subject B

No cream, 15 seconds, moderate erythema.
Cream J, thin coating, 20 minutes, less erythema than 15 second exposure without cream. Apparently less inflammation and more direct tanning.
Cream L, thin coating, 20 minutes, about same as 30 second exposure without cream.
No cream, 30 seconds, fairly strong erythema.

Subject K

No cream, 15 seconds, fairly strong erythema.
Cream J, thin coating, 30 minutes, moderate erythema, but less inflammation than 15 second exposure without cream. Apparently some direct tanning.
Cream L, thin coating, 30 minutes, slightly more erythema than with cream J.
No cream, 30 seconds, strong erythema.
After 2 days all spots appeared to be about equally inflamed.

No cream, 10 seconds, strong erythema.
Cream D, thin coating, 20 minutes, strong erythema.
Cream L, thin coating, 20 minutes, strong erythema.
No cream, 20 seconds, strong erythema.

To test further the relative merits of creams D, J and L, 3 subjects were given thin coatings of these three creams and exposed for 15 minutes each, with the following results:

No cream, 10 seconds.
Subject B, strong erythema.
Subject F, no erythema.
Subject W, moderate erythema.

Cream D, 15 minutes.
Subject B, no erythema.
Subject F, strong erythema.
Subject W, strong erythema, at least as much as 20 second exposure without protective cream.

Cream J, 15 minutes.
Subject B, weak erythema, slightly greater than MPE, apparently some direct tanning.
Subject F, mild erythema, very little inflammation, apparently some direct tanning.
Subject W, very faint erythema or tanning.

Cream L, 15 minutes.
Subject B, strong erythema, about same as 10 second exposure without cream.
Subject F, some erythema, but less than 20 second exposure without protective cream.
Subject W, very mild erythema, slightly above MPE.

No cream, 20 seconds.
Subjects B and W developed strong erythema, but subject F developed only a moderate erythema.

and varying sized irregular "lakes" indicated that the water in the compound had separated from the mixture —rendering it less suitable for use and probably precluding the use of this type of a base, even if the preparation was found to be of value otherwise. Since these bases are of the so-called cold cream type ordinarily made up in pharmacies, their use would be contraindicated for any preparation selected, since the water would be laked out of the compound in freezing and there would no longer be the uniform character so necessary to screen off and absorb the ultraviolet energy.

The other preparations do not seem to change from use of the aforementioned temperatures. It is true that in collapsible tubes [4] the contents are congealed and require a little warming and manipulating before one is able to express them. None of the tubes showed evidence of bursting. It is a question whether this would be true at extremely low temperatures, particularly with preparations of the cold cream type.

Perhaps it would be advisable to use plastic containers because of the scarcity of tin. Glass containers should not be employed because of the danger of splintering in breakage.

Specimen Q is rendered much stiffer by freezing, but by sufficient manipulation and warming, such as it would receive in the tropics, it should lend itself well to application on the skin, even after it has undergone low temperatures from high altitude flying.

SPECTRAL TRANSMISSIONS

As previously mentioned, the only rays pertinent to this study are wavelengths 2,967 and 3,022. The percentages of ultraviolet energy of various wavelengths transmitted by the various protective coatings are given in tables 3 and 4.

Moreover, specimens A, B and G, containing titanium dioxide, may be immediately eliminated because of the tendency for the water to separate out on freezing. Specimens C (titanium dioxide in vanishing cream base), F (phenyl salicylate in unguentum zinci oxidi), Harriet Hubbard Ayers' Sun Cream and specimen R (D and R sun lotion) are eliminated at once because they are so easily washed from the skin.

As to the bases to be employed, freezing experiments have already shown that there should be no water in the compound. Unguentum zinci oxidi does not serve well as a base—it washes off too easily. Moreover, it contains white petrolatum, which is not a good screen. Comparison in table 3 of M (petrolatum flavum) and of N (petrolatum album) shows that the yellow petrolatum alone is eight to ten times as efficient a screen as is the white variety. Another specimen of petrolatum flavum, H, was apparently more refined and not such a good filter. Consequently, further investigation was made of petrolatum flavum samples O, P and Q, from Standard Oil Company of New Jersey (table 4). Both O and P, refined compounds, showed high transmission, 25 to 32 per cent, in the two wavelengths, but Q (dark red vet. petrolatum) was opaque to both wavelengths—in fact it was practically selectively opaque to the wavelengths causing sunburn.

Study of table 3 further reveals that, while titanium dioxide as used in specimens A, B, G and K acted relatively well in preventing transmission of wavelengths 2,967 and 3,022, it did not act as efficiently as phenyl salicylate (salol) in specimens D, J and L. With phenyl salicylate in D (10 per cent phenyl salicylate and 33⅓ per cent zinc oxide in petrolatum flavum) there was no transmission. In specimen J (10 per cent phenyl salicylate in petrolatum flavum) (five examinations) transmission varied from extremes of 6.8 per cent down to 0 at wavelength 2,967, with a mean of 1.5 per cent, and at wavelength 3,022 extremes of 5.9 per cent to 0 and a mean of 0.8 per cent. In specimen L (10 per cent phenyl salicylate and 15 per cent zinc oxide in petrolatum flavum) transmission in thickness of 0.03 mm. was 0.02 per cent at wavelength 2,967 and 0.04 per cent at wavelength 3,022. With a thickness of 0.06 mm. it was entirely zero. As zinc oxide also was present in D and L, the query might be raised as to its value. Phenyl salicylate was present in all these. Specimen E was 33⅓ per cent zinc oxide in petrolatum flavum and the transmission was very low, being 2.2 per cent at wavelength 2,967 in thickness of 0.03 mm. and 0.18 per cent in thickness of 0.06 mm. The transmission at wavelength 3,022 was 3.0 per cent in the thinner and 0.3 per cent in the thicker preparation. Undoubtedly, zinc oxide is not to be ignored as an ultraviolet light filter, and too it has the added advantage of showing where it has been applied. Luckiesh and Taylor have used it in paints for many years for the absorption of ultraviolet. From the standpoint of spectral studies, perhaps, it could be profitably added to a 10 per cent phenyl salicylate in petrolatum flavum—unless it would make the compound too thick and too dry, which would be the case if it was to be added to specimen Q as a base.

Specimen R (D and R sun lotion) containing menthyl salicylate in a thickness of 0.03 mm. gave spectral transmission of 13 per cent in wavelength 2,967 and 16 per cent in wavelength 3,022, while "Sunex" Ointment, Abbott Laboratories, in a thickness of 0.04 mm. gave an even higher transmission, 25 per cent at wavelength 2,967 and 31 per cent at wavelength 3,022. Obviously, both compounds are far too high to be of much value.

ULTRAVIOLET PROTECTION TO THE HUMAN SKIN OF VARIOUS COMPOUNDS

In these experiments of Luckiesh and Taylor on six different subjects there was used an ultraviolet source intensity equivalent to sixty times the most intense sunlight measured in Cleveland over a period of four years. One minute exposure to this source is equivalent to one hour of the most intense sunlight referred to and comparable to about two hours of average midsummer noon sunlight in Cleveland.

While nearly all the specimens were tried out, A, B and G may be eliminated from pertinent discussion because of the throwing out of the water contained in them after undergoing freezing. We may also eliminate C, suggested by Prof. Paul Hanzlik, and F, since they were readily removed from the skin by the washing experiments. Also Harriet Hubbard Ayers' Sun Cream and specimen R (D and R sun lotion), containing menthyl salicylate, are easily washed off. Specimen K (titanium dioxide in petrolatum flavum) was deleted because of the somewhat unsatisfactory results in the spectral transmission experiments. At least Luckiesh and Taylor did not deem it worth investigating further in actual erythemal tests in view of the experiments with A, B and G in which titanium dioxide was used. The results obtained with typical subjects for the various coatings are presented in table 5.

4. Mr. F. W. Treber, of the Miller Drug Company, Cleveland, furnished collapsible tubes and prepared the compounds in them for these experiments.

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Specimen O (extra light amber petrolatum), specimen P (amber parmo [petrolatum U. S. P.]), specimen R (D and R sun lotion) and "Sunex" Ointment were not tested biologically because of their high spectral transmission for wavelengths 2,967 and 3,022.

The most interesting result in the entire series was the biologic test with specimen Q (dark red vet. petrolatum). The exposure of ten seconds on the subject, without any protection, produced a moderately strong erythema, while a twenty minute exposure produced no visible erythema when the same subject had a thin coating of the compound. This exposure was equivalent to twenty hours of the strongest sunlight in Cleveland measured during a four year period. It is quite evident that this petrolatum alone, with nothing added, would give ample protection to the skin. Moreover, the petrolatum rubbed into the skin of one of us several nights in succession gave no evidence of irritation. Dr. E. B. Hunn, chief chemist of Stanco Inc., reported that "the compound is a refined grade of petrolatum, non-irritating even to a sensitive skin. It is neutral in reaction and will conform to the U. S. Pharmacopeia test for freedom from alkali and mineral acids. It is also free from anthracene derivatives, as it is derived from a particular crude oil which is said to be essentially free of anthracene derivatives; and, secondly, any trace of such derivatives in the crude would be removed in the refining process which includes filtration of the product through fullers' earth."

Review of the foregoing data indicates that phenyl salicylate, which is present in D, L and J, apparently plays a great role in prevention of sunburn, for in cream J it is the only constituent added to the petrolatum flavum. In fact, better results are achieved with J than with D and L when zinc oxide is added, 33⅓ per cent in D and 15 per cent in L. Apparently the zinc oxide may even act as a deterrent to phenyl salicylate, for results are not as good as in phenyl salicylate cream. Perhaps the zinc oxide coats the phenyl salicylate particles.

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COMMENT

It is obvious from the washing experiments that any compound selected must be of a character that will adhere quite well to the skin even though waves wash over the subject or even though he is occasionally immersed. This immediately ruled out all preparations in a vanishing cream base or so-called cold cream bases. It also deleted "Sunex" Ointment, D and R sun lotion, 10 per cent phenyl salicylate in unguentum zinci oxidi and Harriet Hubbard Ayers' Sun Cream. Specimen Q (dark red vet. petrolatum) satisfies this requirement admirably. It is very difficult to remove it even with soap and water and scrubbing.

Again, the compound must not be broken down by exposure to low temperatures—this almost at once eliminates all greaseless creams and ordinary cold creams with their water content.

The compound should be as simple as possible and, other things being equal, as easily procured and as inexpensive as possible. The dark red vet. petrolatum again answers these demands.

It should be packed in nonbreakable containers, which should not burst if frozen. Our lowest temperature experiments were — 3 F., which did not break the collapsible tube containers of even cold cream base compounds containing water. With temperatures of — 30 to — 40 F., this might not be the case if there was water in the cream.

There are further essentials necessary in picking a suitable compound. The compound should not become rancid. The compound should lend itself to simple packing and, with the scarcity of tin, perhaps plastic containers would serve the purpose, though collapsible containers are preferable as the preparation would be kept clean and free from dirt, contamination and contact with sea water and sand.

The compound should be free from toxicity and, since phenyl salicylate has been found to be of value, the query arises as to its toxic properties and phenol absorption. For this purpose a 20 per cent phenyl salicylate in petrolatum flavum U. S. P. (i. e. twice the strength of the compound advised) was rubbed into the skin of the right half of the body, excluding the scalp, of 4 hospital patients whose blood urea nitrogen and urinalysis were normal. The unguentum was rubbed in the same region on four successive nights; no bathing was done during this time. Testing of the specific gravity for albumin and of the sediment microscopically was done on the urine after each of the last three applications of the salve; a blood urea nitrogen test was done the day after the last application. At no time did investigation of the urines show any evidence of irritation of the kidneys, nor was there any appreciable rise in the blood urea nitrogen. Ethereal sulfate determinations were made on twenty-four hour urine specimens on the last two days of the investigation. Dr. Ramon Hanzal of the Biochemistry Laboratory of the Institute of Pathology of Western Reserve University School of Medicine made these determinations to indicate the presence of increased phenol excretions. He employed the Folin method, and in none of the 4 patients was there a significant effect on the level of ethereal sulfates excreted in the urine.

The results of the physical and biologic investigations of Luckiesh and Taylor, along with clinical experience, allow certain deductions. The experiments show that titanium dioxide is not a very dependable protective agent, at least specimen K (20 per cent titanium dioxide in petrolatum flavum) did not indicate it in spectral experiments. And in biologic experiments specimens A, B and G, containing titanium, did not compare favorably with other less complex preparations. Zinc oxide is of definite value in preventing sunburn. Menthyl salicylate as tested in specimen R (D and R sun lotion) was not a particularly good agent, nor was "Sunex" (Abbott Laboratories—butesin, metaphen and oleic acid ester amide diethylamine in cold cream). Yellow petrolatum has dependable screening power against ultraviolet energy at wavelengths 2,967 and 3,022, in fact far more than more refined white petrolatum. Specimen Q (dark red vet. petrolatum, the Standard Oil Company of New Jersey) is opaque to these rays and likewise completely protected the skin of a subject to a dose of twenty minutes' exposure, equivalent to twenty hours of the strongest sunlight in Cleveland measured during a four year period. No doubt this simple compound may be employed alone in aviation and naval work as a satisfactory protection from sunburn. But in view of the excellent results with phenyl salicylate we are inclined to recommend that a Kit A be prepared with the dark red vet. petrolatum alone and a Kit B containing the dark red vet. petrolatum plus 10 per cent phenyl salicylate. Both should be tried out and comparisons made.

SUMMARY

1. Most of the erythema resulting from exposure to natural sunlight and skylight is produced by ultraviolet energy shorter than wavelength 3,200.

2. The Army Air Forces desired an agent or agents as a prophylaxis of sunburn. This protective cream or ointment to be stowed in life rafts or military aircraft must have maximum protection per unit weight or volume. It must be stable to heat and cold, free from rancidity, lend itself to simple packing, be nontoxic and not wash off.

3. Experiments were carried out at the Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, to ascertain the safest, most practicable, most cohesive, nontoxic agent or agents to serve this purpose.

4. Dark red vet. petrolatum (Standard Oil Company of New Jersey) was found to be quite opaque to erythemal energy. It likewise served as a complete protection to the skin in an exposure equivalent to twenty hours of the strongest sunlight in Cleveland measured during a four year period. This product in itself is recommended for the protection of aviators marooned on life rafts or in the desert following airplane crashes. The compound is not irritating and adheres tenaciously to the skin.

5. Phenyl salicylate (salol) was also found to be an excellent protection from ultraviolet radiation when put up in a 10 per cent cream. Experiments have also shown it to be nontoxic. It is further felt that a 10 per cent phenyl salicylate incorporated in the dark red vet. petrolatum be also tried as a suitable agent for protection of marooned aviators.

HEPATOLENTICULAR DEGENERATION

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Hepatolenticular degeneration is a rare, progressive and fatal disease characterized by extrapyramidal signs, degenerative changes in the basal ganglions, cirrhosis of the liver and pigmentation of Descemet's membrane at the limbus of the cornea (Kayser-Fleischer ring).

Denny-Brown [1] in a recent review of this subject has pointed out that the work of Hall [2] in establishing the identity of Wilson's disease (progressive lenticular degeneration) and Westphal-Strümpell's disease (pseudosclerosis) has obscured the remarkable differences between the two syndromes. There can be no doubt that the two groups are closely related and should be considered as aspects of the same disease process. To that extent Wilson's attempt to absorb pseudosclerosis into his group of "progressive lenticular degeneration" may have been justified. However, in the cases described by Wilson and most English and American authors the postural changes were prominent and cases with tremor and without postural changes were largely overlooked, although this group had been described by Westphal [3] and Strümpell [4] as "pseudosclerosis" (1883 and 1898). In 1912 von Hösslin and Alzheimer [5] demonstrated diffuse gliosis in pseudosclerosis and in 1909 and 1912 Fleischer [6] noticed the constant occurrence in pseudosclerosis of a golden brown pigmentation in Descemet's membrane at the limbus of the cornea and of cirrhosis of the liver.

Wilson [7] in 1912 published his classic paper, describing the constant association of cirrhosis of the liver with a progressive extrapyramidal disorder which included tremor, postural states, contractures, athetoid movements, rigidity, dysarthria, dysphagia and psychotic symptoms. Although such a description is wide enough to include the clinical features of pseudosclerosis, cases of the latter variety may present a picture far different from those described by Wilson, particularly in the lack of postural and contractural disorders. Wilson described a gross degeneration of the lenticular nuclei, obvious to the naked eye in his cases. This has been found in many cases involving a short course with contractures and postural difficulties. However, it has been well demonstrated that corresponding to the diversity of signs there are also variations in the pathologic manifestations of the disorder. Two clearly defined pathologic extremes exist, namely gross cavitation of the lenticular nuclei (progressive lenticular degeneration of Wilson) on the one hand and, on the other, only the microscopic gliosis described by Alzheimer in pseudosclerosis. Hall [2] in 1921 recorded an intermediate case in which both gliosis and gross lenticular degeneration were present. Hall made it clear that his proposed term of "hepatolenticular degeneration" should include all these variations.

Little is known of the etiology and pathogenesis of hepatolenticular degeneration, and relatively few cases have been investigated with modern methods. In the present study special attention was devoted to the hepatic features of the disease in the hope of gaining more knowledge of the mechanisms involved in the causation of the disturbance.

Certain dietary measures were felt to benefit these patients and are offered here as a therapeutic suggestion.

REPORT OF CASES AND DATA OF CLINICAL INVESTIGATION

CASE 1.—N. R., a Jewish youth aged 18 years, of Russian parentage, was first seen for trembling of the hands in March 1944. He had been referred for psychotherapy, as the variability of the tremor suggested a psychogenic origin. Discovery of the Kayser-Fleischer ring led to the diagnosis of hepatolenticular degeneration. The patient's illness had begun insidiously with tremor of the hands about two years before he was first seen. He was a student of drafting and became first aware of clumsiness and incoordination in handwriting (fig. 1) and drawing, especially in his right hand. Gradually tremor of his arms appeared, complicated by a choreic component and jerky impairment of voluntary movements. These symptoms dis-

Drs. D. Denny-Brown, Raymond D. Adams, Stanley L. Robbins, Stephen Maddock and Andrew Mason and Dorothy Rubanoff cooperated in this work.

From the Neurological Unit and the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard) Boston City Hospital, the Department of Neurology and the Department of Medicine, Harvard Medical School.

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appeared during sleep, were hardly noticeable at rest and were greatly exaggerated by motion. The jerkiness of voluntary movements was also manifested in the lower extremities by an awkward, loose, flinging, tremulous gait. His speech became nasal and reflected awkwardness in voluntary movements of his tongue and accessory palatine musculature as well as tremor. He also complained of hypersalivation but never of rigidity. His emotionality increased, but there was no intellectual deterioration. Despite partial remissions, some of which lasted for several months, he had grown gradually worse.

The patient's parents were first cousins. The father died at the age of 40 of heart disease. The mother was living and well. She had a pes cavus on the left and no other deformities or diseases. There were 3 children in the family, all of whom had hepatolenticular degeneration (cases 2 and 3). There was no history of any neurologic disease in the direct or collateral ancestry except for an uncle (father's brother), who is said to have been unable to take pictures with a camera because of the tremor of his hands. The information available is limited and the family history is incomplete.

The past history revealed common childhood diseases and no history of brain involvement, jaundice or right upper quadrant pain. There had been episodes of "upper respiratory infection," often accompanied by abdominal distress and vomiting, usually of short duration and sometimes requiring bed rest. On all of these occasions there was anorexia for several days. The patient was born and spent his life in a well populated middle class section of the city. No toxic factors were discovered in the patient's surroundings. The family's diet at all times had been varied and made up of about 2,400 calories (carbohydrates 285 Gm., proteins 111 Gm., fat 91 Gm.).

Physical examination showed pronounced myopia and typical Kayser-Fleischer ring in Descemet's membrane of the cornea. Examination of the head and thorax was negative except for slight sinus arrhythmia and a soft systolic murmur at the apex of the heart. The right shoulder was slightly higher than the left. The abdomen was flat with the liver palpable one to two fingerbreadths below the costal margin in the right midclavicular line. The spleen was enlarged to percussion and its lower pole palpable below the costal margin. The genitalia were small for the patient's age, but the pubic hair was well developed and the testes, though small, were of normal consistency. There was a bilateral pes cavus.

Neurologic examination showed a friendly, tall, thin boy with a wide eyed staring expression. He was bright and alert but showed a striking pleasure in telling pointless stories in the middle of a clear and reasonable conversation. There was an overall motor restlessness with a choreiform element in the muscles of the face, arms and trunk. He was never physically or mentally relaxed. When he attempted to smile there resulted a jerky, wry grimace. Except for his wide eyed expression, his face showed nothing suggestive of parkinsonism. A gross rhythmic tremor with a rate of 4 to 6 per second was present in the arms under postural tension and, at times, involved the trunk. This tremor, in the upper extremities, was complicated by a choreic element. Active movements of the arms enhanced the tremor, and extension of the arms caused wide flapping movements of the hands at the wrist joints and rhythmic flexions of the fingers. Coordination in the arms was impaired by tremor and jerkiness, and, while the finger could be accurately approximated to the nose by a series of jerky movements, a gross tremor prevented its being kept in the desired position. At times there were mild dystonic movements of the trunk. Cogwheel rigidity was observed in all joints on passive motion. The motor signs were less pronounced in the lower extremities, where there was little resting tremor but some tremor of motion and sustention. Tremulousness and rigidity caused incoordination in the use of the legs and feet. This became most pronounced when the patient turned suddenly. His stature was erect with the patient appearing to lean slightly backward as if compensating for a propulsion component. The cranial nerves were not remarkable, but the speech was slurred and nasal. All tendon reflexes were weak, and the right patellar jerk and both achilles tendon jerks were absent. The response to plantar stimulation was flexor. The abdominal reflexes were active. Sensory examination was negative.

The diagnosis of hepatolenticular degeneration having been made, a high caloric diet rich in proteins and carbohydrates and poor in fat was prescribed and the patient was discharged. Exacerbation of the tremor accompanied by nausea and vomiting with anorexia lasting for two weeks during which the patient lost 6 pounds (2.7 Kg.) prevented him from ever starting to take his diet. Torsion spasms of the trunk to the right occurred; first once or twice a day, then every hour and, three weeks after discharge, at the time of readmission, continuously, at intervals of ten minutes, lasting five to ten minutes. The patient was well aware of these seizures, describing them as accompanied by complete loss of will power.

Physical examination was essentially unchanged, but the tremor was increased and lateral nystagmus was observed. There were headaches, and a defect of convergence was found. The liver seemed smaller than previously but within normal limits.

The patient was given a diet consisting of 733 Gm. of carbohydrate, 208 Gm. of protein and 22 Gm. of fat (3,692 calories) and within five days he gained 2½ pounds (1.1 Kg.). Torsion spasms and nystagmus disappeared. On the eighth day of this regimen the patient complained of right upper quadrant heaviness and pain, constipation, nausea, anorexia and vomiting, and he refused all food. There were headaches and weakness, and the patient insisted that this episode resembled the many

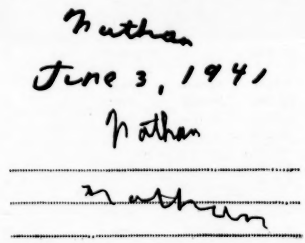

Fig. 1.—Samples of handwriting in case 1. From top to bottom: In 1941, no disease manifest; in 1944, when first seen; six months later.

he had had during past years and which had been called "colds" or "grip." Intravenous administration of amino acids in dextrose solution was necessary, but within a few days and with atropine to combat the nausea the patient was again able to receive his meals and improved steadily during one month. It became possible for him to perform several simple skilled acts which he had been unable to execute for months, such as cleaning his glasses and opening doors and windows. With his general health much improved and all liver function tests (except the cephalin flocculation) negative, the patient was seen fit to undergo a liver biopsy, which was performed by Dr. Andrew Mason under spinal anesthesia and following intravenous infusion of 100 Gm. of dextrose. The patient was given light food and in addition intravenous dextrose with amino acid mixtures as well as subcutaneous injections of synthetic vitamin K-like substance and thiamine, riboflavin, pyridoxine, calcium pantothenate and niacinamide. Urinary retention and intestinal atonia were relieved by catheterization and by physostigmine and enemas. Although no infection was detectable, the patient's temperature on the fourth postoperative day reached 102 F. With the white blood cell count, urine sediment and chest plate remaining negative, the temperature rose to 106.2 F. on the fifth postoperative day and the patient became comatose. Rapid intravenous infusion of 20 per cent dextrose brought the patient back to consciousness, but there remained a variable degree of stupor, inability to articulate and to swallow and a paralysis of the upward gaze. There was a progressive increase in the amplitude and frequency of the tremor, which subsided merely during short moments. As the coma which had responded

so well to large doses of dextrose was interpreted as hypoglycemia due to liver failure, large amounts of amino acids, dextrose and vitamins were given and a continuous starch was made for signs of infection. The liver function tests during this period (summarized in the table) did not significantly change except that the prothrombin concentration fell to 60 per cent of normal and the sulfobromophthalein retention became elevated twenty-four hours before death. About six hours before death pus was discovered in the urine, and subcutaneous sulfadiazine was given. Before this was done the patient seemed to rally and was able to talk. He began however to vomit repeatedly and to hiccup. During the night of the sixth postoperative day the patient suddenly vomited 1,000 cc. of dark guaiac positive material, aspirated a great deal of it and died twenty minutes later in respiratory distress. The clinical diagnosis of the immediate cause of death was rupture of an esophageal varix, brought about by the strain of repeated vomiting. The pallidus on each side, the caudate nuclei and other structures appeared to be intact. Another lesion was found in the right middle frontal convolution, where large areas of the cerebral tissue showed evidence of softening. This was particularly pronounced in the convolutional white matter but also found in the cortex. In these regions the brain tissue had a gray, mottled appearance and the leptomeninges overlapping the softened zones were thickened. A section taken from this part of the brain showed a fairly complete necrosis of all nerve and glial cells in one convolution. These cells had disappeared, leaving only the proliferated endothelium of capillaries and veins and endothelial as well as microglial phagocytes. In adjacent convolutions the parenchymal damage was less severe. Although the architecture of the cortex was deranged, a fair number of nerve cells remained intact. Again the capillary endothelium had undergone hyperplasia; microglial cells were increased in number and showed phagocytic activity. A fair number of large

Some Laboratory Data in Four Cases of Hepatolenticular Degeneration

		Urine Analysis		Liver Function Tests						Blood Chemistry			
					Sulfobromophthalein † Retention		Prothrombin Concentration, % of						
Case	Date	Urobilinogen *	Other Findings	Icterus Index	After 5 Min.[17]	After 15 Min.	Normal[16]	Cephalin Flocculation[19]	Hippuric Acid (Oral)[17]	Total Protein[21]	Albumin[21]	Globulin[21]	Cholesterol[24]
1. N. R.	3/16/44	Normal	None	4	100	5	80	++++	2.72	5.98	....	....	95
	8/23/44	Normal	None	5	40	Trace	100	++++	2.90	....	....	....	100
	9/20/44	.....	None	7	50	0	100	++++	....	6.10	....	....	131
	10/ 2/44	Normal	None	6	20	0	80	++++ +++ ++++	3.40	....	....	....	129
	10/ 8/44‡	.....	Some W.B.C.	8	80	20	60	++++	....	4.90	3.4	1.5	...
2. J. R.	8/23/44	Normal	None	5	..	..	..	++++	....	....	....	....	...
	10/ 3/44	Normal	None	..	30	0	100	++++	3.0	....	....	....	130
	12/27/44	.....	None	..	35	5	100	+	1.06	5.56	3.23	2.33	131
	2/ 9/45§	.....	None	5	30	Trace	60	+++	....	....	....	....	...
	2/12/45	.....	.....	..	..	..	85	+++	....	....	....	....	...
	2/16/45	.....	None	..	..	..	100	++	....	....	....	....	...
	4/27/45	.....	.....	..	45	5	70	+	2.2	5.9	....	....	...
3. M. R.	8/23/44	.....	None	5	30	Trace	100	++++	....	....	....	....	...
	11/ 1/44	Normal	None	..	30	10	100	+ +	....	5.3	....	....	149
	3/ 2/45	.....	None	..	50	10	98	+++	1.80	....	....	....	...
4. I. S.	7/ 8/44	.....	Gran. casts, W.B.C., albumin +	7	100	30	90	+++	1.40	4.5	3.0	1.5	183
	8/22/44	Normal	Gran. casts, W.B.C., albumin +	..	40	0	70	++++	1.50	5.0	....	....	155
	1/27/45	.....	Gran. casts, W.B.C., albumin +	5	35	0	100	+++	1.70	....	....	....	...

* Concentration estimated in progressive dilutions by Ehrlich's reagent, compared to normal.
† Sulfobromophthalein excretion (per cent of dye retained after 5 and 15 minutes following intravenous injection of 150 mg.).
‡ Twenty-four hours before death. § Fifteen days after dental abscess.

severe terminal episode may have been precipitated by the combination of depressed liver function as suggested by a decrease of the prothrombin concentration in spite of continuous administration of vitamin K and by bronchopneumonia which escaped clinical detection but was found at autopsy. The caloric intake of the patient in the postoperative period as charted in retrospect was too low and this with the administration of 1 grain (0.06 Gm.) of morphine in forty-eight hours may have been a precipitating factor.

Pathologic Examination.[8]—The following is a summary of the pathologic findings. The patient's brain has been sectioned serially and a subsequent communication will describe the details of the microscopic examination. The most conspicuous gross lesion in the sections was that illustrated in figure 2. The putamen of each lenticular nucleus was the site of multiple small cavities. Here nerve and glial cells had disappeared, leaving only scattered hypertrophied astrocytes. The globus astrocytes could be seen. The only vascular changes were of the type commonly seen in reactions to necrosis. All blood vessels were patent.

The liver biopsy (six days before death) presented the same gross and microscopic appearance as did the liver at autopsy.

At autopsy the body was well developed and fairly well nourished and did not show obvious signs of chronic wasting disease. The only gross findings of significance were in the liver, lungs and gastrointestinal tract. The liver weighed 1,300 Gm. (a slight reduction in weight). The organ was considerably reduced in size, out of proportion to this slight reduction in weight. Externally the surface was diffusely and uniformly nodular with the individual nodules varying in diameter from 0.5 to 1 cm. (figs. 2, 3 and 4). The color was in general a pale gray-brown with the depressed, fibrous scars standing out as paler gray or white strands of variable width. The organ cut with increased resistance to reveal a slightly more red cut surface in which the roughly spherical nodules were clearly demarcated. The fibrous trabeculae were of vary-

8. Dr. S. L. Robbins made the pathologic description and Dr. R. D. Adams the neuropathologic studies.

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ing size and seemed to follow no uniform pattern. The gallbladder and bile ducts were all within normal limits. The same held true of the blood vessels. Although known to the pathologist, the site of the biopsy which had been taken six days before death could not be detected. The lungs weighed 800 and 580 Gm. on the right and left respectively (increased weight). The pleural surfaces were glistening, gray red, showing scattered subpleural 1 mm. petechial hemorrhages chiefly about the bases. On sections the lobes uniformly exuded copious amounts of serosanguineous fluid and showed similar petechial hemorrhages throughout the cut surface. The gastrointestinal tract was remarkable, as the stomach contained large amounts of red black semifluid material which gave a strongly positive guaiac reaction and was obviously changed blood. Examination of the esophagus and stomach failed to reveal either varix formation or ulceration, and the definite primary site of the hemorrhage could not be identified. (This unsatisfactory conclusion, as pathologists well know, is a not uncommon finding in cases of gastrointestinal hemorrhage.)

Fig. 2.—A section of the cerebrum cut in oblique plane approaching the horizontal. Note multiple small cavities in the outer segments of the lenticular nuclei. This cavitation is especially obvious when the lenticular nuclei are compared with the intact caudate nuclei. The globus pallidus on each side and other structures in subthalamus and midbrain are not altered grossly.

Microscopic examination showed the liver to be diffusely traversed by fibrous bands laid down in no apparent relation to the hepatic architecture, varying greatly in their width and cutting off nodules of liver parenchyma of variable size. In some cases the fibrous cords appeared to partition individual hepatic lobules, but in other areas the scarring appeared to involve many lobules. The fibrous bands assumed the width of a liver lobule in scattered areas and contained numerous proliferating bile ducts, scattered nests of viable liver cells and a moderate lymphocytic infiltration. There were widely scattered areas of apparent liver cell regeneration, but the great majority of the parenchymatous cells appeared to be fairly well preserved, conforming to the original architecture with no obvious signs of acute necrosis at present. The lungs, in addition to congestion and edema, presented early bronchopneumonia.

CASE 2.—J. R., a youth aged 18 years, Jewish, was the identical twin brother of the first patient. The initial symptoms began much earlier than in his brother but had remained comparatively mild. He had noticed some difficulty in handwriting ever since he first went to school at the age of 5 (fig. 6). There were also difficulties in other finely coordinated move-

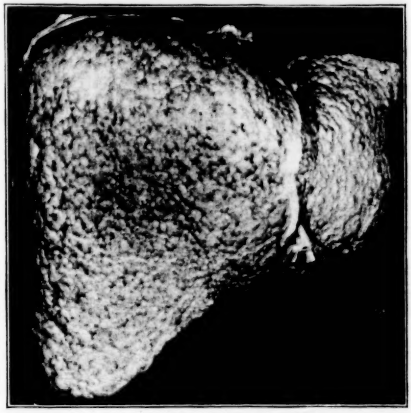

Fig. 3.—Gross appearance of the liver in case 1. External view of entire organ.

ments, such as holding a glass of water. The tremor was inconsistent and often imperceptible. It sometimes appeared at rest and was increased by a sustained motor activity such as squeezing one's hand. In March 1944 physical examination showed a corneal circumlimbar pigmentation similar to that seen in case 1. He also had bilateral pes cavus. His speech and gait were not remarkable. He had an inconstant, variable,

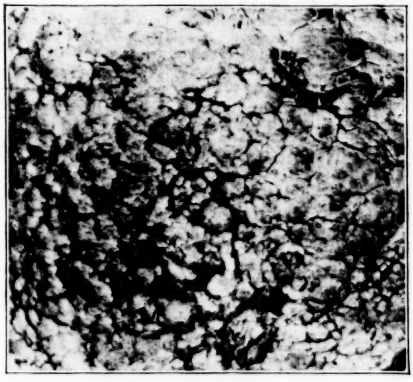

Fig. 4.—Close up of liver surface in case 1.

rhythmic tremor of the hands greatly accentuated by sustained muscle tension. There was slight jerkiness in voluntary movements (fig. 6, handwriting). There were no pyramidal tract signs. The liver was within normal limits and the spleen was not palpable. There were no esophageal varices on roentgenologic examination. The patient refused to follow any dietary prescription and continued eating his regular diet, which con-

sisted of about 2,400 calories: carbohydrate 285 Gm., protein 111 Gm., fat 91 Gm.

Following the death of his twin brother the patient began to be concerned about his own condition and noticed a slowly progressive increase of his tremor, so much so that it became difficult for him to handle the copper plates in the printing shop where he worked.

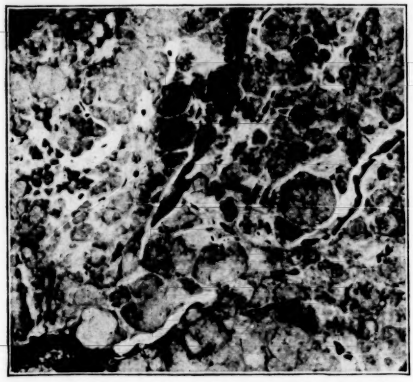

Fig. 5.—Cut section of liver in case 1.

In November 1944 his general condition was about the same except for a slight exacerbation of the tremor of the hands. The liver to percussion and palpation was somewhat smaller than previously, the edge being percussed 2 fingerbreadths above the costal margin in the right midclavicular line. The patient decided to start to take his diet regularly and, following a period of three weeks accompanied by some gastrointestinal difficulties, he succeeded in bringing his caloric intake to the desired level. His weight increased by 2 pounds (0.9 Kg.) in fifteen days. On January 25 he suffered from an infected tooth and had a temperature of 101 F. On extraction of the tooth and sulfadiazine therapy the infection subsided, but the patient remained anorexic and grew progressively weaker. During this time his food intake was definitely far below the desired level. On February 9 he was weak, irritable and pale. There was pronounced tremor of both hands even when at rest. Liver

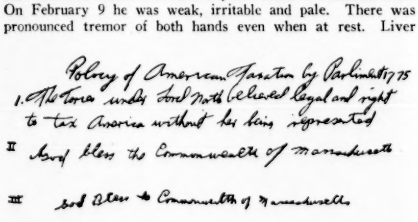

Fig. 6.—Samples of handwriting in case 2: I, in 1942; II, February 1944; III, October 1944; IV, November 1944.

function tests are recorded in the table. It will be noticed that the cephalin flocculation was 3 plus and the prothrombin concentration 60 per cent. As the patient refused intravenous therapy, hourly feedings of carbohydrate and protein were begun in order to give him a daily caloric intake of about 4,000 calories. On February 12, after three days of ingesting 4,000 calories, the patient's mood was much improved and he had gained weight. Four days later he looked even better, stated that he felt hungry in spite of high caloric intake and his tremor was less noticeable. Liver function tests showed a prothrombin of 100 per cent and a 2 plus cephalin flocculation.

Case 3.—*History.*—M. R., aged 19 years, sister of the identical twins (patients 1 and 2), was an art student. In the last two years she had given up fine pencil drawing because of "stiffness" (rigidity) of the fingers. When emotionally disturbed or excited she developed a fine, rhythmic tremor of the hands and arms. She was extremely apprehensive and sensitive. Her menses had ceased abruptly at the age of 16.

Examination.—She too had a Kayser-Fleischer ring identical with those seen in her brothers. There was bilateral pes cavus. She was highly myopic and had a wild, staring expression. At times a fleeting rhythmic tremor was noted in her arms, exaggerated by sustention, like squeezing one's hand. There were suggestions of cogwheel rigidity in the upper extremities. There were no pyramidal tract signs. Her handwriting (fig. 7), while better than that of the second patient, also revealed some

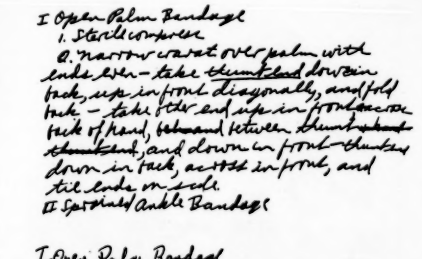

Fig. 7.—Samples of handwriting in case 3: at top, when first seen in 1943; at bottom, February 1944.

difficulty in coordination. Her liver was small but within normal limits, and her spleen was not palpable. Laboratory data are given in the table.

In October 1944 the patient began to suffer from a dry hacking cough, running nose and mild sore throat. With this coryza she noticed three times blood streaked sputum. Shortly thereafter the patient started vomiting several times and refused food during one day. She was admitted to the hospital. On admission, physical examination was the same as in February except that her tremor was coarser and more constant and her motor restlessness more pronounced. There was great emotional instability, and tears appeared on little provocation. Sustained movement of any group of muscles exaggerated the tremor in the muscle group examined. The handwriting showed more signs of difficulty than had previously been noticed (fig. 9). X-rays of the chest and esophagus were negative. The blood streaked sputum was ascribed to congestion of the frontal sinuses, which on x-ray examination showed thickened lining. The patient refused all dietary measures and persisted in leading a rather erratic life. She is getting gradually worse with

increasing tremor and emotional instability. The Kayser-Fleischer ring is growing wider; liver function tests, however, have not significantly changed.

CASE 4.—I. S., a man aged 38, Jewish, a shipping clerk, admitted to the hospital because of tremor of his hands of eight years' duration, had consulted many physicians in the past and had been demonstrated variously as a case of post-encephalitic parkinsonism or of multiple sclerosis. The peculiarities of the neurologic symptoms together with the presence of a distinct Kayser-Fleischer ring led Dr. Denny-Brown to diagnose hepatolenticular degeneration. The patient first noticed the tremor eight years before, when he began to spill fluids from glasses. Later in the course of the first year he broke pencil points and his handwriting began to disintegrate (fig. 8). His symptoms reached a maximum intensity within one month and had persisted ever since with a slight worsening in the year before admission. For about five years there had been

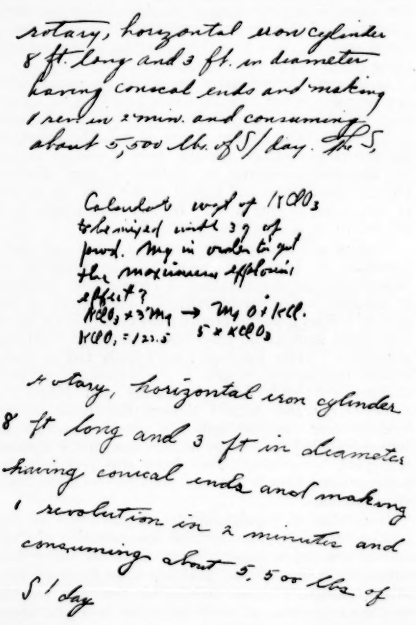

Fig. 8.—Samples of handwriting in case 4: from top to bottom, 1931, 1938, 1944.

mild albuminuria, discovered incidentally during an examination for life insurance. Although the patient was intelligent and observant, he stated that he had not had any gastrointestinal upsets, whereas the patient's wife, a nurse who had known him for five years, was positive that he had numerous attacks of constipation, nausea and anorexia followed by abdominal distress and sometimes diarrhea. He had had a diet high in spiced and fatty foods, rather low in carbohydrates and probably adequate in protein.

The parents of the patient were cousins once removed (fig. 10) and in another branch of the patient's family there had been marriage of cousins and mentally deficient male offspring in alternate generations. From the history of these relatives given by the patient it appears that infectious diseases or birth injury were unlikely factors. The uncertainty of the diagnosis, however, reduces the value of this observation. The patient has one half brother who is in good health. The patient had been working in a soap factory for a while, but the chemicals used there were not of the sort known to cause liver damage.

Physical examination revealed that the patient was thin, intelligent and cooperative. He did not appear to be in any distress. When he stood quietly and relaxed, no tremor was noticeable. The eyes showed a golden brown ring at the limbus of the cornea, and the fundus came into focus at 10

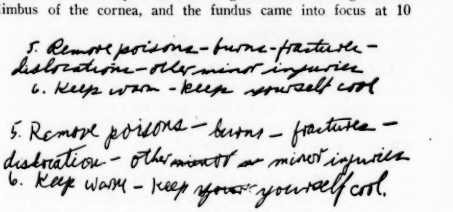

Fig. 9.—Samples of handwriting in case 3: at top, in 1943; at bottom, November 1944 at time of admission to the hospital.

diopters. The liver was palpable about 2 fingerbreadths below the right costal margin in the midclavicular line. The spleen was found to be enlarged on percussion and was not palpable. X-ray studies of the chest, abdomen and esophagus were negative.

The neurologic examination was negative except for the following findings: The patient's speech was somewhat blurred, slow and hesitant, with a nasal note. His tremor was not noticed as long as he stood quietly at rest. When he extended his arms before him the hands flapped at the wrist in gross rhythmic tremor. When the arms were flexed at the elbow and held before the patient the arm became involved with an involuntary gross movement in which the humerus rotated at the shoulder and the forearms flailed up and down. There was a coarse, arrhythmic intention tremor, but it was most pronounced at the point of completion of the intended action, so that on putting his finger on his nose the patient hit the object, but immediately the tremor threw his hand up to his forehead or down below his chin. Alternating movement of the fingers could be performed with the arms supported, but as soon as the arms were left unsupported fine movements were made impossible by the tremor. The patient was hospitalized for a short period for liver studies and was discharged on the 12th of July 1944 on a diet similar to that given to

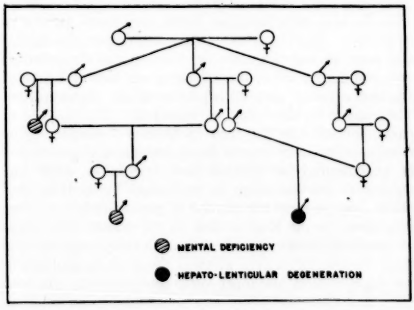

Fig. 10.—Intermarriages and occurrence of degenerative diseases in ancestry of patient 4.

patient 1 but adjusted to a total of about 3,000 calories. He has taken it religiously ever since. It represented for him a great change in eating habits and at first was difficult to get used to. After two months the patient spontaneously reported an improvement in his general condition and a feeling of well being. He felt that his tremor had diminished to some extent. After three months he stated that for the first time

in eight years he could manage to shave. Also for the first time since the onset of his symptoms he was able to fold garments which were manufactured at his place of work into the prescribed shape. The patient is intelligent and has a critical attitude toward the medical profession. Suggestion of improvement in this case seems unlikely. He and his family deny previous remissions. The laboratory studies of the case are reported in the table.

COMMENT

Neurologic Aspects.—The differential diagnosis of hepatolenticular degeneration is of special interest to neurologists. It is striking that many of the cases reported as such were undiagnosed initially and were confused with other conditions.

The diagnosis of hepatolenticular degeneration should be considered in every case of tremor or postural disorder in a young person. The pigmented circumlimbar corneal ring of a golden color is seen in hepatolenticular degeneration and may be considered pathognomonic. Several cases with absence of the Kayser-Fleischer ring have been reported in the literature, and in some instances special measures were necessary to visualize the ring.[9] In most of these cases no postmortem examination had been done, so that the diagnoses remain unproved. On the other hand Hall [2] found the corneal pigmentation present in 20 of 25 proved cases, and unless cirrhosis of the liver can be demonstrated the pigmentation remains the one certain positive clinical sign. Although the presence of the ring is pathognomonic, its absence does not conclusively rule out hepatolenticular degeneration. As Wilson [7] has stressed, the diagnosis should depend on the neurologic evidence of lenticular disease.

The rhythmic tremor, which may be present in repose but not in full relaxation, is brought out or exaggerated by sustained muscular tension rather than by movement. In addition there may be any or all of the other signs of disease of the basal ganglions, chorea, athetosis, dystonia. There are often striking emotional disturbances which may misdirect an examiner toward purely psychiatric considerations.

The most common error in diagnosis is that of mistaking these cases for postencephalitic parkinsonism. This is not surprising, as there are many points of similarity. The rhythmic tremor is qualitatively similar and may be indistinguishable. Emotional disturbances are common in both, but outright oddities of behavior are not a usual part of hepatolenticular degeneration. The plastic rigidity may be identical. The posture of parkinsonism may be seen in Wilson's disease. The resting or latent tremor of hepatolenticular degeneration is exaggerated by motion and sustention while the tremor of parkinsonism is decreased by activity and effort. In general the tremor of parkinsonism is more prominent in the fingers than in the wrist. The signs of postencephalitic parkinsonism develop rapidly and then remain stationary, whereas those of hepatolenticular degeneration are more often progressive. In both disorders there is rarely any pyramidal tract involvement. In some of Wilson's cases the destruction of the lenticular nucleus was so extensive as to impinge on the internal capsule and produce some pyramidal tract signs. The differentiation of postencephalitic parkinsonism and hepatolenticular degeneration may present extreme difficulties.

The disease may be differentiated from choreoathetosis by the fact that the latter disorder is usually associated with hemiplegia and rarely with a parkinsonian tremor. Multiple sclerosis is distinguished chiefly by evidences of remission and asymmetry of signs. In cases in which these features are absent, when optic atrophy is lacking, the peculiar flapping tremor at the wrists and the corneal pigmentation form the chief differentiating characteristics. The possibility of pseudobulbar palsy may be suggested by dysarthria and difficulty in swallowing. However, the presence of pyramidal tract signs and absence of tremor of the extremities are unusual and are against hepatolenticular degeneration. Some cases have been misdiagnosed catatonic schizophrenia and were not recognized until autopsy. It would appear from the foregoing that the signs of organic disease should exclude any consideration of purely functional disorders. Yet many cases, including case 1 in this paper, have been erroneously diagnosed as psychoneurosis.

In general, differential diagnosis of hepatolenticular degeneration is not difficult if it is kept in mind whenever one encounters a case of tremor or postural disorder in a youth. The clinical diagnosis must be based on the neurologic features because there is seldom clinical or laboratory evidence of distinctive liver disease. Direct visualization and biopsy of the liver, as in one of our cases, is conclusive. In this case, however, it proved to be a dangerous procedure.

Medical and Biologic Aspects (comments and interpretation of laboratory studies).—The presence in hepatolenticular degeneration of cirrhosis of the liver at autopsy is a constant feature. The extent of the hepatic lesions found at postmortem usually is far more impressive than would have been anticipated from the symptoms. Liver function tests usually fail to show hepatic dysfunction in spite of the advanced anatomic changes (Walsh,[10] Lüthy,[11] Barnes and Hurst [12]). Sweet, Gray and Allen [13] showed that some of the modern liver function tests are sensitive enough to demonstrate hepatic damage in these cases in the absence of hepatic symptoms. They have also reviewed the evidence that hepatic damage precedes the neurologic manifestations.

The value in hepatolenticular degeneration of the routine procedures used for the demonstration of liver disease was investigated. Sweet, Gray and Allen had found the serum colloidal gold test to be the most sensitive reaction. In our hands this test was reliable in a series of cases of cirrhosis of the liver and acute hepatitis. It was found, however, negative in cases of hepatolenticular degeneration. It should be noted that the diagnosis of some of the cases of Sweet, Gray and Allen was by no means conclusive and that the colloidal gold solutions used in this hospital are prepared according to Merritt and Fremont-Smith [14] in a way slightly different from that indicated by Gray.[15] For these reasons it seems impossible to draw any conclusions from these contradictory results in a small group of cases.

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The liver function tests (recorded in the table) were done by the surgical research laboratory of the hospital and the technics used were those described by Quick [16] for the prothrombin time, White, Deutsch and Maddock [17] for the sulfobromophthalein excretion test, Quick [18] for the hippuric acid synthesis test and Hanger [19] for the cephalin flocculation test. Intravenous glucose tolerance tests were performed according to the technic of Lozner and his associates,[20] and other laboratory methods used were those described by Peters and Van Slyke.[21]

The glucose tolerance tests were repeatedly normal in all of the cases. Of all the liver function tests the cephalin flocculation test alone either varied along with the changes in the patient's condition (cases 2 and 3) or remained consistently positive, thus indicating liver disease which was undoubtedly present. The remaining liver function tests showed either normal values, insignificant deviations from the normal or inconsistent changes. This picture of liver function tests was especially striking in case 1, in which at the time of liver biopsy which revealed extensive anatomic damage (figs. 2, 3 and 4), none of the tests, except the cephalin flocculation, indicated any damage. This shows that liver disturbance in this disease may be present and developed to a high degree and still may remain unrecognized. Thus one argument of those who think the neurologic disturbance to be the primary factor because no liver damage is sometimes evident prior to the appearance of neurologic signs loses its value. The terminal changes of the liver function tests in case 1 and their behavior during an infectious episode in case 2 are presumptive evidence that the liver disorder in this disease varies in intensity and is subject to exacerbations in times of functional stress. In the literature no member of a family suffering from the disease has developed nervous lesions at a time when cirrhosis has been definitely proved to be absent, whereas there are a number of cases on record in which one sibling has been found to have cirrhosis without nervous lesions.

Experimental evidence points to the liver as the organ primarily involved and perhaps responsible for the lesions of the central nervous system. Although Graef, Negrin and Page [22] have observed cirrhosis of the liver following the causation of hypothalamic lesions, they argue that the mechanism may be an indirect one through changes of feeding habit. Whether this may apply to patients with Wilson's disease remains doubtful. The work of Kallo and Oberling,[23] who have produced liver changes through lesions to the lenticular nuclei, has never been repeated and their evidence is not conclusive. On the other hand, Mahaim [24] produced central nervous lesions in dogs by causing severe hepatic damage by the injection of 50 per cent alcohol into the biliary tract. The cerebral lesions were observed thirty to eighty days following the causation of the hepatic damage and were "intense lesions of the nerve cells with slight predominance for the cortex and particular vascular and neurological lesions in the central nuclei of the thalamus and the caudate nucleus" (translated). Kirschbaum [25] obtained similar lesions in the brain of one dog which survived ligation of the hepatic artery for ninety days. Crandall and Weil [26] demonstrated in vitro a substance in the serum of dogs with experimental hepatic lesions that was causing damage to the myelin sheaths of rats' spinal cords when these were incubated for twenty-four hours at 37 C. in such serums. The serum of the same dog was inactive in this respect prior to liver lesions. We were unable to obtain any clearcut results when spinal cords of rats were incubated in the serum of our patients. Pathologic evidence shows that liver disease can cause brain lesions (Scherer,[27] Schaltenbrand [28]) and in hepatolenticular degeneration the clinical impression [13] points in the same direction.

The few facts known about the pathogenesis of hepatolenticular degeneration suggest the liver as one important factor. Observation of our patients showed that exacerbations followed or were accompanied by periods of low food intake and gastrointestinal distress. On the other hand all remissions observed followed periods of high food intake. These facts lead to the use in these patients of high caloric diets low in fat (4,000 calories, 3,000 derived from carbohydrate, 600 from protein and 400 at the most from fat). Such diets have recently been given in this disease by Wollaeger and Shands,[29] but these authors report no observations on the effects of this treatment in their patients. Dimitz and Vujić [30] had reported some success in 1925 from a high caloric, meatless diet. Obviously the effects of such dietary measures in a chronic neurologic disease are hard to evaluate and, as liver function tests sometimes vary even in untreated patients, they are of little help. Furthermore, one cannot expect a reversal of clinical symptoms due to irreparable anatomic damage of the central nervous system. Final evaluation of any therapy is possible only after a period exceeding the average life expectancy of such patients, and some presumptive evidence could be gained if a previously slowly progressive course could be arrested for a period lasting longer than any previous remission. Detailed metabolic studies which are in progress also might bring a better knowledge of the nutritional aspects of the disease. In the 3 treated patients of this series who were under observation for two, six and ten months respectively while taking diets, as described, clinical observation alone (in the absence of any measurable data) suggested that they all got somewhat better and

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that their neurologic disturbances became stationary and certainly in 1 case (4) improved somewhat. The dietary measures appeared to be of help in shortening setbacks associated with minor infections.

CONCLUSIONS AND SUMMARY

1. Four cases of hepatolenticular degeneration (1 with biopsy of the liver and autopsy, 2 in siblings of this patient) had all been previously misdiagnosed as either parkinsonism, psychoneurosis or multiple sclerosis.

2. Laboratory studies disclosed that the cephalin flocculation test alone of all liver function tests performed was positive in the majority of cases, whereas the hippuric acid synthesis, sulfobromophthalein excretion and the prothrombin time were often not significantly altered even in the presence of pronounced anatomic liver changes. Positive liver function tests in periods of functional stress indicated the capricious type of liver disease, with periods of detectable impairment of function alternating with periods of functional adequacy.

3. In these cases, where exacerbations were related to periods of inadequate diet, remissions followed periods during which the patients had been taking high caloric diets relatively low in fat. In 1 patient the first remission in eight years occurred after institution of such a diet.

MALARIA THERAPY IN SYPHILITIC PRIMARY OPTIC ATROPHY

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Malaria therapy, according to Moore and Woods,[1] is the most efficacious method of treatment of primary syphilitic optic atrophy. This therapeutic study of the Johns Hopkins group, done with the greatest accuracy and comprising 250 patients, has no equal in the literature. Others [2] observed similar gratifying results with the use of malarial fever.

In the opinion of Kierland and O'Leary [3] malaria treatment is also superior to Swift-Ellis therapy in the control of failing vision due to syphilis. The abandonment of intraspinal therapy is advocated because of its tendency to extinguish vision suddenly in 10 per cent of patients so treated.[4]

There are no comparable large and well studied groups of patients with syphilitic optic atrophy who were treated with artificial fever. In the small series of patients who were subjected to hyperpyrexia by Menagh [5] and Neymann [6] the percentage of visual improvement appears to be lower than in the malaria treated patients with optic atrophy.

From the Research Department, Central State Hospital, Indianapolis.
Paper presented under the auspices of the Section on Nervous and Mental Diseases.
The study was aided by a grant from the American Social Hygiene Association and the American Society for the Prevention of Blindness.

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PATHOGENESIS OF PRIMARY SYPHILITIC OPTIC ATROPHY

It is difficult to understand, at first sight, why malaria therapy should be useful in syphilitic optic atrophy, which has generally been looked on as a degenerative process. In the past there have been many misconceptions as to this condition, first of all, that syphilitic optic atrophy is just another variety of the tabetic process. This idea had early led to the designation of "tabetic optic atrophy," a term which should be discarded in favor of "primary syphilitic optic atrophy." To the clinician it has been a long established fact that so-called tabetic optic atrophy is not confined to tabetic patients but occurs not infrequently in dementia paralytica, in meningovascular syphilis and even in syphilitic persons who never had and never will develop any sign of tabes.

Moore and Woods [4] made the important observation that there is no significant difference in the prognosis of treated or untreated optic atrophy, whether this condition is associated with any of the three main types of neurosyphilis or whether it occurs as an isolated symptom in an individual with syphilis. From the clinical facts only they concluded that there is probably also no difference as to the pathology and the pathogenesis. In this conclusion I concur after having examined microscopically in the past fifteen years the visual pathways of 70 patients with all types of syphilis of the central nervous system. Of these, 10 had complete syphilitic optic atrophy and 2 had unilateral optic atrophy. Others had optic nerve changes ranging from the earliest lesion to far advanced atrophy but still leaving the patient with some useful vision. In another group the optic nerves were normal.

From the study of this large anatomic material it became apparent that primary syphilitic optic atrophy is due to a chronic inflammatory process followed by degeneration of the nerve fibers. Infiltrations, composed of lymphocytes and plasma cells, extend from the periphery along the septums toward the interior, producing first marginal degeneration of the optic nerves. On the perimeter this manifests itself in a concentric and slowly advancing narrowing of the visual fields. In other instances of optic atrophy the entire diameter or large irregular sectors of the optic nerves become involved at once by the inflammatory process. The principal site of the exudative features is in the intracranial portion of the optic nerves or in the chiasm or both and is dependent on a varying degree of syphilitic basilar meningitis. From here the atrophy of the visual nerve fibers proceeds in both directions. The essential lesion in the interior of the optic nerves and chiasm consists of cellular infiltrations in the septal connective tissue and around the blood vessels (fig. 1). Only if there is an extensive exudative process at one time or another in the interior of the nerves will optic atrophy occur. A few scattered lymphocytes and plasma cells within the visual pathways, while not completely harmless, will not cause large scale degeneration of the nerve fibers. In addition there is round cell infiltration in the pia of the intracranial optic nerves and chiasm (fig. 2). The latter, it should be emphasized, may be present without atrophy of the optic nerves.

The pathologic basis of syphilitic optic atrophy, therefore, is more like the process of dementia paralytica than of tabes. This knowledge is not new. Previous investigators made the same observation. In other words, my own findings uphold the anatomic studies

of Léri,[7] Stargardt[8] and Richter[9] that the primary lesion in syphilitic atrophy of the optic nerves is a peripheral and interstitial neuritis, which is followed by a slow secondary degeneration of the nerve fibers. Many writers on this subject have been so fascinated by the term tabetic optic atrophy that they have overlooked this important conclusion of the earlier workers, or they have become confused by the many different opinions which have been expressed on the pathogenesis of optic atrophy.

MECHANISM OF MALARIAL THERAPY IN THE ARREST OF SYPHILITIC OPTIC ATROPHY

After having gained a more accurate insight into the pathogenesis of syphilitic optic atrophy, it is easier for one to understand the beneficial action of malaria treatment. One of the more important effects of malaria therapy consists in arresting the inflammatory phase of the neurosyphilitic process. It is not yet known in exactly what manner this is brought about. There is evidence that the activation of the mesodermal tissue, which is produced by the malaria plasmodia and not by the elevated temperature, is responsible for the cessation of the inflammatory reaction.[10]

Fig. 1.—Perivascular infiltration of vessel in interior of optic chiasm in syphilitic primary optic atrophy. Toluidin blue stain.

The exudative phenomena have usually been interpreted as the direct effect of Treponema pallidum. Therefore, it was argued, if temperatures above normal destroy the spirochetes, the round cell infiltrations will recede. For practical purposes it has been shown, however, that hyperpyrexia which can be produced with safety in man is not deleterious to the syphilitic organism.[11]

In this connection the question arises: What is the relation of T. pallidum to optic atrophy? Igersheimer[12] made special studies concerning this problem. He observed an occasional spirochete in the meninges of the atrophied nerves in one third of the cases. On account of the scarcity of spirochetes, Igersheimer felt that treponemes are not directly responsible for the degeneration of the optic nerves. In my own material not a single treponeme was observed in the optic nerves, although in 1 instance masses of treponemes were present in the cortex of an orbital convolution immediately opposite the atrophied nerves. Spirochete studies in other types of neurosyphilis also tend to show that the pathologic process is only indirectly the result of T. pallidum. At the present stage of knowledge the exact relationship of the treponemes to the microscopic changes in the pathogenesis of the various types of neurosyphilis is not definitely known. Varied stages of tissue immunity obviously play an important role.

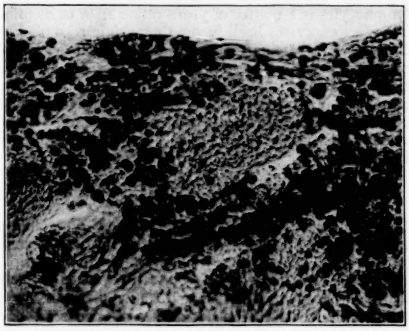

Fig. 2.—Round cell infiltration in pia of optic nerve, penetrating along the septums toward the interior in syphilitic primary optic atrophy. Hematoxylin-eosin stain.

Malaria therapy, besides changing the tissue immunity, inhibits the inflammatory element of syphilitic optic atrophy, and the secondary degeneration of the nerve fibers ceases. Since most frequently the inflammatory process advances from the periphery toward the interior, enough normal tissue of the central portion of the nerve is left for useful vision (fig. 3).

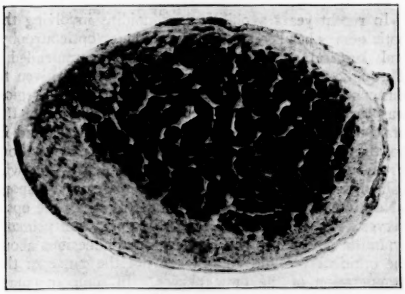

Fig. 3.—Beginning syphilitic optic atrophy, arrested by malaria therapy. The optic nerve shows a large marginal area of degeneration. Following malaria treatment the irregular contraction of the visual field ceased to progress. Myelin sheath stain.

Unfortunately, in a number of patients optic atrophy progresses in spite of malaria therapy. For some unknown reason malaria is ineffective. The inflammatory feature continues unabated, and complete optic atrophy ensues. Or malaria therapy arrests the exuda-

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tive process, but the resorption of the round cell infiltrations is so slow that degeneration of the nerve fibers is almost complete before all the inflammatory cells have been removed. If one has the opportunity to examine the optic nerves of patients with syphilitic optic atrophy who have been treated with malaria, one will find that the absorption of the plasma cells and lymphocytes is a matter of years rather than of months. This fact expresses itself in the therapeutic results. For three years following malaria therapy slow progression of failure of vision may continue. Thereafter, no additional loss of vision has been noted.[4] On the other hand, in the patients who react most favorably to malaria treatment the concentric constriction of the visual fields will gradually expand, evidencing a capacity for recovery of partially damaged nerve fibers.

CAN THE TREATMENT OF SYPHILITIC OPTIC ATROPHY BE IMPROVED?

It is quite evident, then, that treatment of syphilitic optic atrophy depends on the arrest of the chronic inflammation within the optic nerves. On this principle rests, to a large degree, the effectiveness of malaria therapy. In favorable cases one course of malaria will suffice. If visual failure continues to progress, one should contemplate another course of malaria. Quartan malaria (Plasmodium malariae) will have to be used, since in the interim an immunity has developed to the tertian strain with which the patient was previously inoculated.

Penicillin has been shown to reduce in neurosyphilis the increased cell count of the spinal fluid. To follow up malaria with penicillin or give it concomitantly may be a worthwhile procedure by enhancing the anti-inflammatory action of malaria therapy. To rely on penicillin alone would be hazardous. In my experience penicillin does not come up to the efficacy of malaria in the treatment of dementia paralytica, and the same may be true in its use in syphilitic optic atrophy.

SURGICAL INTERVENTION FOR SYPHILITIC OPTIC ATROPHY

In recent years syphilitic arachnoiditis involving the optic nerves has been held responsible for optic atrophy, and surgical intervention has been recommended.[13] Throughout this study especial attention was given to this conception. In every instance the chiasmatic region was carefully examined at necropsy. The base of the brain with the optic nerves and with the arachnoid in position was embedded for microscopic examination. From the histologic investigation the impression was gained that optochiasmatic arachnoiditis may be responsible in an exceptional case for the atrophy of the optic nerves. In by far the largest majority of primary syphilitic optic atrophy the arachnoidal adhesions about the optic nerves and chiasm are not the cause of the degeneration of the optic nerves. In some instances of syphilitic optic atrophy there is no adhesive arachnoiditis whatever in the optochiasmatic region. In others the thickened arachnoid passes harmlessly over the optic nerves. If in such cases the fibrosed and infiltrated arachnoid is surgically removed, there still remains within the optic nerves the inflammatory process, which is the essential factor in producing degeneration of the visual nerve fibers.

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CONCLUSIONS

The good results with malaria therapy in the control of syphilitic optic atrophy can best be explained on the basis that the degeneration of the optic nerves is due to an inflammatory process, which is arrested by malaria treatment.

A patient with failing vision due to syphilitic primary optic atrophy should at once receive malaria therapy.

Routine antisyphilitic treatment with trivalent arsphenamine, bismuth and mercury is entirely inefficacious in syphilitic optic atrophy, and the patient will become blind almost as rapidly as if he had received no treatment at all.

ABSTRACT OF DISCUSSION

Udo J. Wile, Medical Director (R), U. S. Public Health Service: Among all of the late sequelae of acquired neurosyphilis, cases of primary optic atrophy have been, from the standpoint of therapy, the most hopeless group. Prolonged treatment with arsenicals, heavy metal and iodides fail to elicit any therapeutic response on the progressive changes of the optic nerve which ultimately lead to complete amaurosis. I am in accordance with Dr. Bruetsch's statement that, following the use of malaria, many cases have responded by a definite slowing up of the process, and a few have established a status quo which permitted the patient to sustain a limited vision indefinitely. In the absence of definite foci of spirochetes, such beneficial changes could be due only either to the relief of pressure, if this was present, or by the resolution or arrest of an inflammatory process as outlined by Dr. Bruetsch. Similar results, probably explainable on the same basis, occur with the not infrequent relief of root pains in tabes. Here again we are dealing not with the presence of organisms but with an inflammatory condition of the posterior roots and ganglions, which seems to be relieved not only by bouts of fever induced by malaria but also by mechanically induced pyrexia. My experiences convince me that thus far fever therapy, and particularly malaria, offers the only hope for arresting or delaying the process of optic atrophy. The mechanism of this therapy is adequately explained by Dr. Bruetsch's theory that the degeneration is caused by an inflammatory process.

Dr. Alan C. Woods, Baltimore: I agree with the author that optic atrophy is not limited to tabes. However, it is still true that the majority of patients with syphilitic optic atrophy also have tabes, which certainly indicates some close link in the pathogenesis of the two. I also agree that inflammatory reactions are responsible for the degeneration of the optic nerves. However, since in syphilis the inflammatory process is the response to an infectious agent, there is no reason to suggest that "the pathologic process is only indirectly the result of Treponema pallidum." The failure to find spirochetes in the optic nerve does not preclude their presence. Even in dementia paralytica, in which their presence is accepted beyond doubt, investigators as careful as Jahnel, for example, do not always find spirochetes in the brain. In my experience, fever treatment with malaria or with artificial hyperpyrexia has produced changes in the spinal fluid indicating an abatement of the inflammatory processes as evidenced by a drop in cell count and total protein. We therefore can rightfully assume that fever is largely responsible for the therapeutic success. Our present methods of treating central nervous system syphilis thus far have never given 100 per cent results. In some of the cases of failure the therapeutic method itself must be held responsible. In other cases the tempo and extent of the disease process are such that our present methods of treatment are totally inadequate. Therefore, in rapidly progressing failure of vision, just as in rapidly progressing dementia paralytica, the chances of arrest are poor, and when the entire optic nerve is involved the prospect of preservation of useful vision with the weapons at hand is also poor. One must also realize that the progression

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of tissue change once initiated by inflammatory reactions may continue because of various secondary forces. It is still too early, I feel, to conclude that fever produced by malaria or other methods, alone or combined with penicillin, is superior to penicillin as the single therapeutic agent when penicillin is given in optimum time-quantity dosages. The author is to be complimented for his provocative thinking on the question of the pathogenesis of neurosyphilitic processes.

DR. J. E. MOORE, Baltimore: It is urgently to be desired that the pathologic study of syphilitic primary optic atrophy, which Dr. Bruetsch has here presented in brief summary, be subsequently published in expanded form. The student of the subject desires much greater documentation, with correlation of clinical data, treatment administered and pathologic findings. Especially gratifying to the clinician is Bruetsch's concurrence in the favorable effect of malaria in arresting the progress of the atrophic process, and his insistence on the immediate necessity for this form of treatment as soon as the diagnosis is established. Likewise important, in view of the recent fad for surgical intervention in this country and abroad, is the author's demonstration that, in the majority of cases of syphilitic primary optic atrophy, adhesive optochiasmatic arachnoiditis plays no part in the development or progress of the atrophy. From the clinical point of view it is difficult to agree completely with the author's concept of the pathogenesis of optic atrophy and his statement that its pathologic basis is more like that of dementia paralytica than of tabes. As observed clinically, primary optic atrophy is actually far more frequent in tabes than in any other form of neurosyphilis. In dementia paralytica, optic atrophy rarely occurs except when tabes is associated, and the entire disease process is properly designated taboparesis. In tabes itself, it is an old and frequently confirmed observation that optic atrophy is often the first manifestation, occurring years before the development of obvious damage to the posterior roots and columns of the spinal cord. These facts and others have led many observers, including myself, to the hypothesis that the pathogenesis of syphilitic primary optic atrophy is identical with the pathogenesis of tabes dorsalis itself. The latter is as yet unknown. Tabes differs from all other forms of neurosyphilis in many extraordinary respects, among which are the extreme selectivity of the neurologic damage, the absence of treponemes in the nervous system (here pointed out by Bruetsch himself for the optic nerves), the low reagin content of blood and spinal fluid, and the refractoriness of the disease to treatment. A tabes-like disease, with degeneration of the posterior roots and columns of the spinal cord, of the peripheral nerves, and with primary optic atrophy, has been produced in experimental animals by prolonged maintenance on a diet deficient in certain components of vitamin B. Is it possible that the reason some neurosyphilitic patients develop tabes with or without optic atrophy, or the latter alone, is a combination of the influence of syphilis with some other factor not as yet defined, possibly dietary deficiency? The answer to this fascinating question is likely to be had, if at all, neither from clinical nor from pathologic observations on neurosyphilitic patients but instead from carefully planned experimentation.

DR. BERNHARD DATTNER, New York: I am completely in accord with Dr. Bruetsch's chief point, that malaria therapy is the indicated treatment in syphilitic primary optic atrophy and that in terms of the final visual result it is definitely superior to either intraspinal therapy or to routine antisyphilitic treatment with trivalent arsenicals and heavy metals. I am likewise in agreement with Dr. Bruetsch that the atrophic process in the nerves usually begins in the intracranial portion of the nerve and is characterized by thickening and perivascular round cell infiltrations of the overlying pia and its intraseptal prolongations in the nerve. The degeneration occurs first usually in the marginal fibers, often involves nerve bundles and may also involve the central papillomacular bundle. However, I am not convinced that the primary degeneration of the optic nerves, which in my experience is seen predominatingly in association with tabes and taboparesis, is paralytica, is entirely secondary to preceding inflammatory changes either in the pial septums or around the blood vessels. The large mass of anatomic material assembled by Dr. Bruetsch is impressive, and one awaits with interest a detailed report on the point emphasized by Dr. Bruetsch, namely that the degenerative process in the nerve is always secondary to an extensive preceding exudative process. If this point can be established it will go a long way to clearing up the enigma of primary syphilitic optic atrophy. If one grants Dr. Bruetsch's hypothesis of the pathogenesis of primary syphilitic optic atrophy, his conclusion that the mechanism of malarial therapy is an arrest of the neurosyphilitic inflammatory process is quite logical. Indeed, in a way the conclusion supports the original hypothesis. Ophthalmologists have for years employed the nonspecific protein reaction in the treatment of ocular inflammation and have amassed a considerable volume of evidence to indicate its value. However, the nonspecific protein reaction is a complex affair including not only the febrile reaction and leukocytosis but a general stimulation of the reticuloendothelial system, changes in the permeability of the capillaries, alterations in the colloidal contents and stability of the serum with changes in the sedimentation rate, immunologic changes with a mobilization of preformed antibodies and tissue desensitization, and various other changes. While there is a widespread belief that the beneficial clinical changes which follow the reaction are largely proportional to the degree of fever and leukocytosis which accompany it, this is far from being universally accepted, and many observers believe that equal, if not superior, results are obtained with mild proteins which cause little fever or leukocytosis. They attribute the favorable results to other phases of the nonspecific protein reaction. Dr. Bruetsch takes the latter view and cites in its support his 1932 work, which demonstrated that malarial therapy produced a reaction in the reticuloendothelial system, with stimulation of the capillary endothelium, the histiocytes and undifferentiated mesenchyme cells. This makes a logical argument, and considerable sound experimental work may be cited to support this view. The argument is predicated, however, on the premise that the degeneration in the optic nerves is secondary to a preceding inflammatory reaction. The evidence on this point is not yet entirely convincing. The theory that the degeneration in the optic nerves and posterior columns is secondary to a combination of neurosyphilis and vitamin deficiency is likewise bolstered by sound experimental work. I do not think it can as yet be discarded in favor of the evidence here presented. I am in full accord with Dr. Bruetsch on his views on opticochiasmoarachnoiditis.

DR. WALTER L. BRUETSCH, Indianapolis: The discussers are in accord that malaria therapy is the most efficacious method of treatment of syphilitic primary optic atrophy. As to the degree of efficacy of penicillin alone, no definite statements can be made. The audience has been somewhat astounded by my statement that the pathologic basis of so-called tabetic optic atrophy is more like that of dementia paralytica than of tabes. In the past forty years only five anatomic studies have been made which consisted of sufficient material to be of conclusive value (Léri 1904, Stargardt 1913, Richter 1921, Igersheimer 1926, Behr 1917-1938). Every one of these investigators, with the exception of Behr, agrees that there is an inflammatory process in syphilitic primary optic atrophy and that the pathologic changes in the optic nerves are the same whether the optic atrophy occurs in tabes or in dementia paralytica. They are also the same in meningovascular syphilis. Optic atrophy occurs more frequently in tabes. The pathogenesis of syphilitic optic atrophy is linked up with the pathogenesis of tabes dorsalis. However, an expert on the histopathology of tabes such as Richter disclaims any semblance of the histopathology of tabetic optic atrophy to the process in the cord in tabes. Syphilitic primary optic atrophy, particularly the early and intermediate stage, is by no means rare in cases of dementia paralytica without tabetic cord involvement. The reason why in dementia paralytica optic atrophy has not been observed more often clinically is the fact that in the era before the advent of malaria therapy dementia paralytica, in contrast to tabes, was a fatal disease within an average of one to three years. Later the same therapy, namely malaria, which reversed the inflammatory process in the paretic brain cortex, also arrested the exudative process in the optic nerves, which in the early stage is limited to the marginal zone. The marginal degeneration of syphilitic optic atrophy has usually extended far into the interior of the optic nerves before the patient becomes aware of failing vision and consults a physician. At that time the process in the optic

nerves has already existed for several years. For this very reason every syphilitic individual with a positive spinal fluid should have a visual field examination once a year. If a narrowing of the visual fields is present although the optic disks may still be normal, a diagnosis of beginning syphilitic optic atrophy is justified, and malaria therapy enforced by penicillin should be instituted. There is no conclusive evidence that vitamin deficiency plays any role in the production of syphilitic primary optic atrophy. The experimental work to which Dr. Moore referred is far from being convincing, and in human neuropathology nothing is known that even in extreme cases of the vitamin deficiency diseases the optic nerves become involved. It would be unfortunate if, on account of this suggestion, attempts should be made to treat syphilitic optic atrophy with vitamin pills.

SHIGA DYSENTERY

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In New Guinea, as in other parts of the world, bacillary dysentery, or shiga dysentery, will always be an important problem. It is particularly important to the armed forces because it renders fighting men noneffective and it increases the burden of the Medical Corps. Because of the necessity for keeping units of the armed forces as close to full effective strength as is feasible, it is desirable to utilize every means of arriving at the diagnosis as early as possible in order to shorten the period of hospitalization and to return such patients to duty.

By formal definition bacillary dysentery, or shiga dysentery, is an acute infectious disease of the lower bowel caused by the Shigella group of organisms and manifested by fever, cramps, nausea, vomiting and frequent stools containing mucus, pus and blood. Often the arbitrary statement is made that the stools of bacillary dysentery may be distinguished by the presence of pus, blood and mucus, that those of amebic dysentery contain only blood and mucus, and that the stools of simple diarrhea contain only mucus. Such a statement is correct in well developed cases but may be misleading in the earliest phase of the disease, the phase in which the certainty of diagnosis is most important.

All too often there is a tendency among soldiers to ignore various types of diarrhea or dysentery until their symptoms become severe. Anything less severe may be dismissed under the common designation "the G. I.'s," and the soldier may place the blame on the cleansing soap, on dirt on the mess gear or even on the chlorine in the water.

DIAGNOSIS

The medical officer who sees the patient first may not have adequate facilities at hand for immediate examination of more specialized type. His judgment as to whether a patient with frequent stools should be admitted to a hospital should be guided by the patient's general condition, by the severity of the diarrhea and by the presence of either of the other cardinal symptoms, namely fever or cramps. If the latter are present, further investigation is mandatory. A moderate percentage of patients in tropical areas may have only toxemic symptoms at the onset, and attention may not be directed to the bowel until loose stools appear, sometimes as long as two days later. Early symptoms may suggest dengue fever or malaria or other conditions manifested by fever and headache, and for that reason repeated questioning may be needed to get the patient to mention his first bowel symptoms.

The earliest positive diagnosis of bacillary dysentery is made by proctoscopy or proctosigmoidoscopy. Contrary to the common conception of such an examination as part of the initial physical evaluation, the procedure is neither difficult nor painful in patients with diarrhea. It is done as easily as the routine rectal digital, and with no more bother. If the patient is allowed to empty his bowel immediately before the proctoscope is inserted, the bowel usually will be found perfectly prepared for examination. An enema as preparation merely fills the bowel with poorly absorbed water, thereby creating interference. Furthermore, an enema may alter somewhat the true appearance of the bowel mucosa. I have found the knee-chest position most practical for the patient during the examination under field conditions. In most patients the diagnosis can be made with the instrument inserted no more than 5 inches, and the procedure requires only a few minutes. Specific diagnosis by culture of the stool usually requires two or more days, and there is a fair chance that the cultures will be negative. The early stools often do not contain pus or blood either grossly or microscopically. It is neither necessary nor desirable to wait for characteristic stools to appear before making the working diagnosis of bacillary dysentery.

SUBJECT MATERIAL

The material covered in this paper includes 87 cases of shiga dysentery seen in an army station hospital in New Guinea between May 1944 and March 1945. The number studied gives no idea of the incidence of the disease, since it includes no borderline cases and because many patients are treated in dispensaries. The purpose of the study was to increase the speed of accurate differentiation of bacillary dysentery from other forms of dysentery and to determine visually the response of the mucosal lesions to various types of treatment. Diagnostic proctoscopy was performed as soon as possible after it was suspected that the condition was the result of infection of the bowel. In some patients this could be done within a few hours after the onset of symptoms; in others who had been treated for a time in more forward areas or at local dispensaries such examinations were necessarily delayed. Subsequent to the initial examination, proctoscopy or sigmoidoscopy was performed at short intervals in order to follow the changes occurring during treatment.

The symptomatology of bacillary dysentery is variable, depending on the strain of organism, its virulence, the size of the initial infection and the general condition and resistance of the patient. One group of symptoms includes those caused by the acute toxemia resulting from absorption of exotoxin of Shigella dysenteriae or of small amounts of the endotoxin of Shigella paradysenteriae. To such toxemia can be attributed the fever, headache, chill, malaise, nausea, vomiting and generalized aches seen, in that general order of frequency. As a rule the acute toxic symptoms subside spontaneously in one to three days. The second group of symptoms is the result of bowel involvement and includes frequent bowel movements, cramps and the passage of bloody and purulent stools. Such diarrhea is watery and urgent, and in those cases in which a large amount of tenesmus is present there is usually an unusual amount of low rectal involvement. Stools number from one to forty each twenty-four hours, usually averaging between five and ten in that time. Fever ranging from 99.5 F. to 105 F. averages about 101.2 F. maximum. The cramps in shiga dysentery are

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nearly always low abdominal, although occasionally they occur in the mid or upper abdomen. Headache may be very severe, as indicated by the fact that 1 patient in our series had an admitting diagnosis of possible meningitis.

Physical findings are of little help in making a positive diagnosis of bacillary dysentery. Often, however, a tenderness over the descending colon helps to confirm the suspicion that the bowel is the source of the initial headache and fever. It was a little surprising to find the spleen palpable in 7 of the 87 cases in the series. No malarial plasmodia were found in thick blood smears, and as the acute toxemia disappeared the splenic enlargement could no longer be demonstrated. Two patients had algid or cholera-like dysentery with subnormal temperature, blood pressure falling to the shock level, clammy profuse perspiration and a severe prostrating diarrhea. One came on three days after herniorrhaphy, and the other developed three days after appendectomy for suppurative appendicitis. In addition to the use of large quantities of parenteral saline solution, the administration of sodium sulfadiazine intravenously led to dramatic improvement within twenty-four hours.

LABORATORY FINDINGS

In this series of cases routine laboratory tests were done but had only negative diagnostic value. The leukocyte counts ranged from 3,300 to 17,500, with an average value of 8,500. Microscopic examinations of stools showed no parasites or ova. Red and white blood cells and macrophages frequently were visualized.

In the 87 cases studied stool cultures taken before treatment was started were positive for Shigella organisms in 48.2 per cent. Various strains of Shigella paradysenteriae were isolated in 40 patients. Shigella ambigua was found in 2 and, through accident, 3 patients did not have stool cultures taken before treatment was started.

PROCTOSIGMOIDOSCOPIC FINDINGS

The types of bowel lesions seen on proctoscopy depend on the stage of the disease, on the virulence of the organism and on whether or not chemotherapy has been used prior to the examination. There are several salient features on which the diagnosis may be based.

1. *Early Phase.*—Even when the symptoms have been present only a few hours, the common features are found. Mucosal edema and diffuse hyperemia form the background. The edema may be barely discernible or the mucosa may present a waterlogged appearance. Usually the capillary dilatation is diffuse and the usual vascular pattern of the mucosa is lost. The mucosa may present a pink to red velvety surface. Punctate, flame-shaped or ecchymotic hemorrhages are visible either in the mucosa or beneath it. Studded through the mucosal surface in this acute phase there may be the most characteristic lesions of all, miliary mucosal abscesses of pin point or pin head size. These are creamy in color, slightly elevated and probably represent localized accumulations of leukocytes. These "abscesses" in the untreated cases become topped by shallow ulcerations. When the patient receives suitable chemotherapy the "abscesses" may disappear quickly or be replaced by reddish "granulation." Early, in the more acute cases, there may be a diffuse superficial necrosis of the mucosa, with dissolution of the normally smooth surface and the formation of a pseudomembrane which clings closely. This may be wiped free, leaving a red to purple raw mucosal surface which may be friable enough to bleed freely, giving frank blood mixed with pus or mucus in the lumen of the bowel. It is in the early acute phase of bacillary dysentery that the best opportunity for quick healing is offered. Up to a certain point in this infection the bowel mucosa may endure toxic changes without sustaining poorly reversible damage. After such damage has occurred, however, the lesions must run their own course, and their resolution is less quickly influenced by chemotherapy.

If a patient with bacillary dysentery receives no treatment, or if several days elapse before medical care is sought or treatment given, one of several things usually happens. The disease may be mild enough to run its course quickly without treatment, it may run a delayed course or it may reach an indolent ulcerative stage. It is the delayed course which shows best the middle phase of healing.

2. *Middle Phase.*—The mucosal changes in this phase are usually accelerated by chemotherapy. With or without treatment the lesions of the initial process clear in an order chronologically the opposite of their appearance. If first seen during this middle phase the mucosa may not have much residual edema, and fresh or fairly old granulations may have developed at the sites of previous mucosal necrosis or abscesses. These granulations vary in number and size. They are usually irregular in shape and separated by the fairly normal areas of mucosa not previously involved by necrosis. The granulations are usually a dusky red or purple, and in their centers superficial ulcers may or may not be seen. When present, such ulcers may vary from 0.5 mm. to over 1 cm. in diameter and may be round, oval or serpiginous. Their bases may be distinctly gray and dirty. The proximal surfaces of the valves of Houston are favorite sites for granulations and ulcers, although there is no regularity of location. A patient with much rectal tenesmus may have most of his mucosal lesions in the distal 6 cm. of the bowel.

As these lesions heal, the free pus and blood disappear from the lumen of the bowel and soon afterward the mucosal edema lessens. The diffuseness of the mucosal hyperemia as well as evidences of necrosis and pseudomembrane is lost. The abscesses and sometimes the hemorrhages vanish with only a trace remaining. Granulation fills in the ulcerations and may assume an elevated mulberry studded appearance. These dusky granulations usually become progressively lighter in color until a vague pink lymphoid type area remains. When this is no longer evident there is a restoration of the normal vascular pattern of the mucosa.

In 1 or 2 subacute cases of great severity fairly deep ulcerations of the mucosa were present, together with waterlogging edema of the interval mucosa, which ballooned over the edges of the ulcers, making them resemble an undermining type.

The most characteristic lesions of this phase are the ulcerations and the granulations which are part of the healing process. The granulations may be reluctant to disappear from the mucosa even though there may be no coincidental clinical symptoms. A red to purplish dry granulation may lend to considerable areas of the mucosa a mulberry appearance, while at the same time there may be no diarrhea or cramps. Such lesions often persist for many days after the patient could be considered cured symptomatically.

Immediate diagnosis and prompt adequate chemotherapy are necessary to prevent the development of such slowly reversible lesions.

3. *Late Phase.*—In a number of cases of untreated acute bacillary dysentery there occurs an indolent ulcerative phase in which the ulcers are more discrete. Such ulcers usually have a dirty gray base and the edges and interval mucosa may show little or no reaction. Sometimes persistent slowly healing ulcers leave superficial scarring, as manifested by areas of pallor and loss of the normal blood vascular pattern. These areas may be made more prominent by surrounding hyperplasia of lymphoid tissue. In our experience it is uncommon to see much late thickening of mucosa or of valve edges. Only 1 patient was seen with residual formation of tiny globular retention cysts in the mucosal surface.

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis of the many conditions associated with diarrhea and the other symptoms suggestive of bacillary dysentery, one might mention amebic dysentery, gastroenteritis of undetermined cause, salmonella infections such as paratyphoid fever, idiopathic ulcerative colitis, cholera, staphylococcic food poisoning, epidemic diarrhea with nausea and vomiting, schistosomiasis, segmental enteritis, bowel neoplasms, balantidiasis, irritable bowel and malaria. In New Guinea bacillary dysentery must be differentiated most commonly from acute amebic dysentery, acute gastroenteritis, staphylococcic food poisoning, salmonellosis and epidemic diarrhea. In 90 per cent of instances we feel it is possible to make an early positive diagnosis of shiga dysentery by means of the proctosigmoidoscope.

As a rule in gastroenteritis, staphylococcic food poisoning and epidemic diarrhea we have found only mild edema and mild hyperemia of the mucosa.

In the proctoscopic examination of 11 cases of proved paratyphoid fever with diarrheic symptoms the chief value was a negative one in that it was possible in each instance to exclude bacillary dysentery. In 3 of these confirmed cases the diagnosis of paratyphoid fever was made by the proctoscopic picture and in 1 it was suspected. The paratyphoid fever cases with positive findings on proctosigmoidoscopy exhibited a mottled lymphoid mucosal hyperplasia of moderate degree. This occurred irregularly and was light pink, not red as one expects in ordinary hyperemia. Two of the patients had numerous small, round and oval ulcers rather evenly distributed on the tops of the lymphoid mucosal prominences.

Differentiation of borderline types of acute amebic dysentery is sometimes difficult. The usual type has characteristic discrete ulcerations which tend to be deeper and more evenly distributed than the ulcers of shiga dysentery There is more tendency to thick hyperplastic mucosal involvement, and it is common for the interval mucosa to be quite normal in appearance. Quite often the discrete ulcers have blood oozing out of their bases while at the same time no pus is visible. This is hardly ever seen in shiga dysentery. In the advanced cases of amebic colitis the deeper involvement gives a characteristic undermining of the ulcers and sometimes deep necrotic and sloughing areas with exposure of the muscular layers of the bowel.

EVALUATION OF RESPONSE TO TREATMENT

In studying the response of bacillary dysentery with and without various forms of treatment, it is necessary to take into consideration the fact that in many instances the disease is mild and more or less self limited and that the symptoms may clear spontaneously. In other cases the clinical symptoms clear spontaneously but the demonstrable mucosal lesions may persist. In previous studies [1] the criteria for response to treatment have been the cessation of symptoms and the length of hospitalization. Unless proctosigmoidoscopic studies have been made, such criteria are misleading. It can be demonstrated repeatedly in this condition that, although the relief of cramps and diarrhea by sulfadiazine is usually prompt or dramatic, the healing of the mucosal lesions seems dependent on how much time has elapsed between the onset of symptoms and the institution of chemotherapy. When the diagnosis is made and treatment started within twenty-four hours after onset of symptoms, the objective response to therapy may be as dramatic as was the relief of symptoms. If several days have passed during which symptoms were ignored, misunderstood or inadequately treated, the initial phase of toxic changes passes and ulcerations become more definite. The healing of such ulcerations passes through the usual phases of healing seen in any type of ulcer and naturally this requires time. The golden period of treatment of bacillary dysentery lies in the first twelve to twenty-four hours after onset of symptoms. This fact again emphasizes that proper treatment is dependent on rapid diagnosis before the stool culture can be of help.

In the attempt to evaluate the objective response to treatment of this series of cases, four groups were studied: (1) cases without chemotherapy, (2) cases with sulfaguanidine therapy alone, (3) cases treated with sulfadiazine alone and (4) cases treated with a combination of sulfadiazine and sulfaguanidine. We had no other suitable chemotherapeutic agents available.

General therapeutic measures common to all the groups included bed rest and liquid diet for twenty-four hours and in several instances intravenous administration of isotonic solution of sodium chloride. Paregoric and bismuth were not used in treatment. After the first day the diet was increased rapidly to full quantities.

When sulfaguanidine was given the patient received 4 Gm. every three hours for four doses, then 2 Gm. every four hours for a total of seventy-two hours, totaling 46 Gm. When sulfadiazine was used, equal weights of sodium bicarbonate were given. The initial dose was 4 Gm. of sulfadiazine followed by 2 Gm. every four hours for four doses, then 1 Gm. every four hours for four doses and 1 Gm. every six hours for seven doses, making a total of 23 Gm. in seventy-two hours. In a few instances maintenance doses of sulfadiazine were continued for up to a week. With the combined treatment, the usual sulfadiazine routine was followed for three days. During the last day of these, the sulfaguanidine routine was given and continued the fourth and fifth days of treatment, making a total of five days of therapy. These amounts were used without regard for the weight of the patient. An increase in the fluid intake to 3,000 cc. daily was encouraged, and in most instances subsequent leukocyte counts and urinalyses were made. Determinations of blood sulfonamide levels were made on many of the patients and the highest levels attained during sulfadiazine therapy ranged from 6 mg. to 22 mg. per hundred cubic centimeters. No reactions to sulfadiazine were encountered. Two patients receiving sulfaguanidine had drug reactions:

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1 manifested by headache, nausea and fever sustained at about 101 F., the other manifested by chilliness, fever to 104 F., headache, backache and slight splenic enlargement. Other sources of fever were excluded, and the temperature and spleen returned to normal after discontinuance of the drug. The second patient had had an initial therapeutic course of sulfadiazine without untoward reaction.

SYMPTOMATIC RESPONSE

In evaluating the relief of symptoms, record was kept of the disappearance of fever, cramps and diarrhea and of the time required for the establishment either of constipation or of normal bowel habit. This can be shown best by table 1. It may be seen that while some of the untreated cases subsided very promptly, most of them were classed as slow in response. The relief during sulfaguanidine therapy was faster than when none was administered. The remarkable relief of symptoms during sulfadiazine or combined sulfadiazine and sulfaguanidine therapy seemed to be chiefly the response to sulfadiazine. These results were more remarkable than apparent from the figures. Because of the need for treating the sickest patients with the most effective means available, a large percentage of those treated with sulfadiazine were of the most severe type and some of them had extensive subacute lesions of relatively long duration.

OBJECTIVE RESPONSE

The objective response to therapy (table 2) was determined by repeated proctosigmoidoscopies made at one to three or four day intervals, depending on the rate of healing. From two to ten examinations were performed on each patient. Here again many of the cases had been existent for sufficient time to render them rather resistant even to sulfadiazine. The extra time required for objective healing in these cases, all of which fell into the third and fourth therapeutic groups, elevated the average time required for clearing of the lesions treated with sulfadiazine alone or in combination. In those patients who had had their symptoms only a few hours before our diagnosis and treatment, the objective healing response was so swift and complete as to leave no conceivable doubt as to the effectiveness of the treatment. In even the worst of such necrotizing mucosal processes, if sulfadiazine treatment could be begun within twelve to twenty-four hours after onset of symptoms it was usually possible to anticipate objectively complete clearing of the lesions and restoration of a normal bowel within three to ten days.

Even with the most severe cases included in the sulfadiazine group, the average of seven days required for healing was significantly less than the average time required for disappearance of the lesions in cases treated with nothing or with sulfaguanidine alone.

Review of the 14 patients to whom no treatment was given shows that 7 had a mild form of bacillary dysentery in which demonstrable lesions subsided spontaneously in from six to fourteen days. Seven of the patients had symptoms and lesions which continued long enough to lead to a sense of shame at depriving them of treatment. Two of these finally cleared spontaneously. The other 5 had to have chemotherapy to terminate their symptoms and lesions. Sulfaguanidine, when finally given, cured both within a few days. With the help of chemotherapy these lesions healed in the eighth to twentieth days. In the last 5 of the 7 patients there was no doubt of the indolence of the process up to the time sulfaguanidine was given, although it is entirely possible that the lesions would have cleared ultimately without chemotherapy.

EFFECT OF CHEMOTHERAPY ON STOOL CULTURES

The question of persistence of positive cultures of the fecal content of the bowel is an important one from the point of view of direct transmission and subsequent carrier states. In our experience sulfadiazine is just as effective as sulfaguanidine in rendering such stool cultures negative. Of 87 patients, 42 had positive stool cultures before treatment. After treatment with sulfaguanidine, of 8 patients with positive stools before treatment, all had negative stools after treatment. Of 20 patients having positive stool cultures, sulfadiazine rendered the cultures negative in 18. The other 2 patients had to be evacuated for other reasons before the cultures became negative. Of 10 patients having positive stool cultures before treatment, all had negative cultures after the combined use of sulfadiazine and sulfaguanidine. In several patients with serial cultures taken twice daily by way of the proctoscope, it was found that sulfadiazine therapy rendered cultures negative within twenty-four to thirty-six hours. Such effectiveness decreases the period during which it is necessary to isolate such patients.

TABLE 1.—*Relief of Symptoms of Shiga Dysentery During Various Forms of Treatment*

Treatment	Symptomatic Relief					Total Cases
	Dramatic, 1 Day	Prompt, 2-3 Days	Moderate, 4-5 Days	Slow, More Than 5 Days	None	
None	0	3	1	6	4	14
Sulfaguanidine	0	6	9	5	0	20
Sulfadiazine	22	9	1	2	0	34
Sulfadiazine plus sulfaguanidine	14	2	2	1	0	19

TABLE 2.—*Healing of Mucosal Lesions of Shiga Dysentery as Demonstrated by Repeated Proctosigmoidoscopies During Various Forms of Treatment*

Case Groups	Hospital Stay, Average Days	Time Required for Healing	
		Average Days	Range, Days
No treatment	15.9	11.3	6-20
Sulfaguanidine	16.1	10.2	3-16
Sulfadiazine	12.9	7.0	2-14
Sulfadiazine plus sulfaguanidine	15.6	10.8	3-21
All cases	14.9	9.8	2-25

QUESTION OF CHRONIC BACILLARY DYSENTERY

A number of years ago during an outbreak of bacillary dysentery in a state hospital 2 patients with proved shiga dysentery continued to have persistent dysenteric symptoms. One, an old man, died of inanition about four months later. The second, a man aged 60 who remained in an acute manic phase of a manic-depressive psychosis, died three months after the onset of his dysentery. At autopsy in both patients many chronic ulcers were found scattered through the colon. Some of the ulcers were deep, some were shallow. Three other cases, not included in the present series, deserve comment. One patient for three weeks had had inadequate treatment prior to his admission for a severe dysentery caused by Shigella ambigua. Although he improved considerably on adequate chemotherapy, he

continued to have symptoms and persistent shallow ulcerations of the mucosa during the sixty days of our observation before his evacuation. The second patient had had an acute bacillary dysentery five months before being seen by us, and in those months he had had about ten brief recurrences with intermittently positive stool cultures for Shigella paradysenteriae. He had never been hospitalized or examined with the proctoscope and treatment had been haphazard. On admission to the hospital after five months of recurrent symptoms chronic mucosal ulcerations were demonstrated by proctoscope although he was having formed stools at the time. Even on adequate treatment these lesions required over three months to heal. The third patient had had repeatedly recurrent episodes of dysentery following an initial acute attack four months before. He had received sulfaguanidine therapy for demonstrable mucosal ulceration in two other hospitals where he had been treated. The first proctoscopy by us following his last episode of diarrhea revealed that the bowel mucosa was normal except for several vaguely outlined pallid areas, and many stool cultures were negative. Following an operation for ingrown toenails, he developed acute bacillary dysentery with fever, cramps, many typical stools, culture positive for Shigella paradysenteriae and proctoscopic findings of hyperemia and edema which accentuated the previously noted pallid areas. Sulfadiazine quickly controlled his symptoms, and the bowel mucosa regained the appearance which it had had when it was first seen. We felt that this represented a chronic bacillary dysentery with acute exacerbation. These patients are cited chiefly to illustrate the belief that bacillary dysentery can give rise to one form of chronic ulcerative colitis. The first 2 had had no chemotherapy, and the last 3 had received late, haphazard or inadequate chemotherapy. Such cases emphasize the need for immediate diagnosis and prompt adequate chemotherapy in this disease.

CONCLUSIONS

1. The early diagnosis of bacillary dysentery can be made rapidly and accurately by proctosigmoidoscopy. Such examination should be made promptly whenever a patient complains of diarrhea and abdominal cramps either with or without associated fever. The use of the proctoscope for the immediate diagnosis of bacillary dysentery is as practical as the use of an otoscope or ear speculum in the diagnosis of otitis media.

2. Preliminary diagnostic and frequent subsequent proctosigmoidoscopies were made in cases of bacillary dysentery seen in New Guinea.

3. Pathologic mucosal changes were visible and diagnostic within two to twenty-four hours after the onset of symptoms.

4. In this series of 87 cases, 48 per cent had negative stool cultures and might have had incorrect diagnoses if proctoscopy had not been performed.

5. Repeated proctosigmoidoscopies were made to determine the comparative effects which various types of therapy have on objective healing of the bowel lesions. Fourteen cases were treated with bed rest and a low residue diet. Twenty cases were treated with sulfaguanidine alone, 34 with sulfadiazine alone and 19 with a combination of the two sulfonamides.

6. It is felt that the golden period for effective therapy in this condition occurs during the first twenty-four hours of symptoms. At that time the initial toxic changes in the mucosa are most easily reversible. If effective treatment is postponed until stool cultures are reported, the consequent ulcerative changes require much extra time to disappear and in a few cases such lesions become very resistant to treatment. Three patients were encountered with what seemed to be a form of chronic ulcerative colitis due to shiga dysentery.

7. Effective early treatment with sulfadiazine usually leads to prompt or dramatic cessation of diarrhea and cramps. However, symptomatic relief is not paralleled by objective healing of the mucosal lesions, which to heal may require three days or three weeks or longer depending on the length of time elapsing between the onset of symptoms and the institution of therapy. The objective healing of the mucosal lesions was significantly faster during chemotherapy, especially during the use of sulfadiazine. This was attributed to the readier access of the soluble sulfonamide to the causative organisms by way of the capillaries.

8. The immediate proctosigmoidoscopic diagnosis of bacillary dysentery permits prompt specific treatment, quick relief of symptoms, accelerated objective healing, a shorter period of hospitalization and reduction of the chances of mortality.

9. Empirical sulfonamide treatment of dysentery before proctosigmoidoscopic examination has established the diagnosis is to be deprecated because of the danger of overlooking causes which may be of more serious significance than bacillary dysentery.

PARATHYROID ADENOMA AND HYPERTROPHY OF THE PARATHYROID GLANDS

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The clinical recognition of hyperparathyroidism depends on interpretation of its protean manifestations. These have been divided into (1) those symptoms resulting from chemical alterations in the blood, (2) those symptoms resulting from involvement of the urinary tract and (3) those symptoms resulting from involvement of the skeleton.[1] At first the disease was recognized only in instances of far advanced skeletal disease. More recently a considerably larger group of cases have been reported in which renal symptoms predominated and skeletal involvement was minimal or absent. Albright, Aub and Bauer [2] have pointed out that hyperparathyroidism with bone disease may occur without evident renal lesions and that hyperparathyroidism with renal lesions can occur without bone involvement. It is therefore apparent that neither osseous nor renal lesions need necessarily be conspicuous in hyperparathyroidism. Keating and Cook [3] have mentioned one proved instance of hyperparathyroidism in which there was no evidence of bone or renal involvement. In any case in which hyperparathyroidism is suspected from the clinical manifestations, confirmation of the diagnosis depends on the interpretation of chemical analysis of the blood and urine for calcium and phosphorus.[4]

From the Section on Pathologic Anatomy.
Dr. H. E. Robertson, Dr. J. W. Kernohan and Dr. F. Raymond Keating Jr. contributed advice in the arrangement of this paper.

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3. Keating, F. R., Jr., and Cook, E. N.: The Recognition of Primary Hyperparathyroidism: An Analysis of 24 Cases, J. Urol., to be published.
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In the absence of conspicuous renal or skeletal disease, hyperparathyroidism could be expected to produce only the symptoms attributed to hypercalcemia per se. These include nausea, vomiting, weakness, lethargy and anorexia and have been most conspicuous in instances of severe or acute hyperparathyroidism, spontaneous or experimentally produced, of the type sometimes referred to as parathyroid poisoning.

Parathyroid overdosage was first produced in dogs by Collip [5] in 1926. A similar picture was also produced by Collip [6] by the injection of certain inorganic salts. Later it was demonstrated by Hueper [7] that dogs dying of acute parathyroid poisoning presented metastatic calcifications in organs such as the kidneys, lungs and stomach. Vomiting, anorexia, failure of the kidneys and death in a state of uremia from parathyroid overdosage in acute animal experiments were described by Thomson and Collip.[8] The findings at necropsy in dogs dying from acute experimental hyperparathyroidism were described by Cantarow, Stewart and Hausel.[9]

It is probable that the case reported by Dawson and Struthers [10] is the first example of acute hyperparathyroidism occurring in man due to parathyroid tumor. Listlessness, drowsiness, fever and vomiting have been reported in a boy 5 years of age given 100 units of parathyroid injection daily for six days by error.[11] Recovery occurred when administration of the parathyroid injection was discontinued. Hanes [12] in 1939 reported the first example of death from parathyroid poisoning in man that was observed clinically. In his case hyperparathyroidism was diagnosed but, before operation could be performed, the patient became extremely weak and nervous, had elevated temperature and generalized aching and died. At necropsy an adenoma of the parathyroid was found. In addition there were "widespread injury necrosis and calcification of connective tissue, especially that forming the basement membrane of the parenchymatous organs and the arteries of medium and arteriolar size." Hepatic focal necrosis was present. Calcification was present in the kidneys and myocardium to a high degree. Calcium deposits of a lesser degree were present in the stomach and lungs. There was widespread calcification of the media of the arterioles in the heart, kidneys and lungs.

Oliver [13] has described 2 cases of death from acute hyperparathyroidism. The clinical features were vomiting, anorexia, loss of weight, asthenia, constipation and mental retardation. Fever, drowsiness and tachycardia were present. At postmortem examination a chief cell adenoma of the parathyroid gland was found with metastatic calcification in the kidneys, heart, lungs, stomach and arterioles.

The fifth case of acute hyperparathyroidism to be confirmed by necropsy was reported in 1940 by Smith and Cooke.[14] For two years the patient had noticed limping, pains in the legs and constipation. These were followed by abdominal pain, vomiting, tachycardia and delirium. An adenoma of the parathyroid composed of chief cells was found at necropsy. There was metastatic calcification of the kidneys and the pancreas.

It is my purpose in this paper to present the findings in 2 cases of probable acute hyperparathyroidism associated with duodenal ulcer. This coexistence has not been reported previously. Castleman and Mallory,[15] however, cited chief cell hyperplasia (secondary hyperplasia) of mild degree occurring in 2 cases in which there were duodenal ulcers.

REPORT OF CASES

CASE 1.—A Negro man aged 36, first admitted to the Mayo Clinic Nov. 11, 1943, for seven years previously had noted intermittent epigastric pain, usually relieved with alkaline powders. In the year preceding admission the pain had become more severe than it had been before. He was said to have had syphilis in 1923 and to have received antisyphilitic treatment.

Fig. 1 (case 1).—Posterior view of the organs of the neck and adenoma of the right inferior parathyroid. The esophagus has been opened. Both lobes of the thyroid are seen.

The results of the physical examination disclosed a temperature of 98 F., pulse rate 66 beats per minute and blood pressure 110 mm. of mercury systolic and 80 diastolic.

The tonsils, which were large, were infected. The remaining examination gave negative results.

The urine had a specific gravity of 1.020, its reaction was acid and it was negative for albumin and sugar and on microscopic examination. A complete blood count was normal. The Kahn, Kline, Hinton and Kolmer reactions were all negative.

A roentgenographic examination of the thorax gave negative results. Gastrointestinal roentgenograms revealed the presence of a duodenal ulcer, but there was no evidence obtained of pyloric obstruction.

The patient was hospitalized and routine treatment for ulcer was started. Tonsillectomy was performed on November 15. The postoperative course was uneventful for three days but then severe, continued vomiting developed. This was not associated with epigastric pain or nausea. It occurred after eating and at times lasted for several hours. The vomiting continued for eight days and then stopped.

The patient was well for two months after dismissal, but then epigastric distress recurred. This continued intermittently until July 1944, when it necessitated hospital care elsewhere. On his entering the hospital, administration of an ulcer diet with milk, calcium and magnesium phosphate was begun. After two days of this regimen, persistent vomiting developed and remained unabated for three weeks' time in spite of all treat-

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9. Cantarow, A.; Stewart, H. L., and Hausel, E. L.: Experimental Acute Hyperparathyroidism: II. Morphologic Changes, Endocrinology **22**: 13-27 (Jan.) 1938.
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13. Oliver, W. A.: Acute Hyperparathyroidism, Lancet **2**: 240-244 (July 29) 1939.
14. Smith, F. B., and Cooke, R. T.: Acute Fatal Hyperparathyroidism, Lancet **2**: 650-651 (Nov. 23) 1940.
15. Castleman, Benjamin, and Mallory, T. B.: Parathyroid Hyperplasia in Chronic Renal Insufficiency, Am. J. Path. **13**: 553-574 (May) 1937.

ment. Roentgenographic examination at this time again revealed a duodenal ulcer but no retention of barium in the stomach.

The vomiting ceased after dismissal from the hospital, and on Aug. 11, 1944 the patient was readmitted to the Mayo Clinic. The results of reexamination were unchanged except that a loss of 25 pounds (11.3 Kg.) was noted since last admission. He appeared apathetic and listless at this time. Questionable enlargement of the thyroid was noted. The blood pressure ranged from 140/80 to 170/110.

The urine was normal except for an occasional hyaline and granular cast. The blood count was normal. The Kline, Kahn, Hinton and Kolmer reactions were still negative. The concentration of urea was 38 mg. per hundred cubic centimeters of whole blood. The concentration of chlorides was 578 mg. per hundred cubic centimeters of plasma. The carbon dioxide combining power was 57.9 volumes per cent. The total acidity of the gastric contents was 82; free hydrochloric acid 69, no blood. The duodenal ulcer was again visualized, but no gastric retention was present.

The patient was hospitalized, and administration of an ulcer diet with aluminum phosphate gel and Sippy powders was begun.

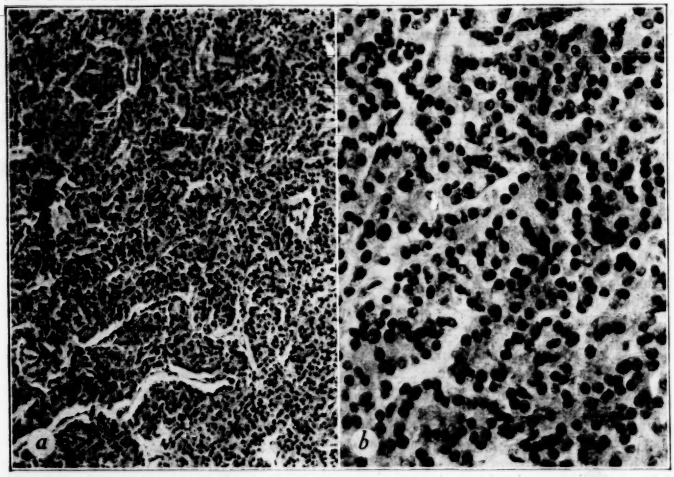

Fig. 2 (case 1).—*a*, adenoma of the parathyroid gland composed of chief cells (× 120); *b*, chief cells in adenoma of the parathyroid (× 350).

Five days after admission, persistent vomiting reappeared. This, as before, was unaccompanied by pain and associated with only slight nausea. Throughout the period of hospitalization the patient had a peculiar listlessness, weakness and apathy which was unexplained. Psychiatric examination revealed evidence of an agitated depression, which had been increasing in severity for the past two months.

The vomiting, listlessness and apathy continued. In addition, headache appeared and the patient became disoriented. A hepatic function test was done on August 21, and pronounced retention of dye (sulfobromophthalein method) was found. The serum bilirubin was 1.5 mg. per hundred cubic centimeters direct and 0.3 mg. indirect. On August 27 for a short period he was unable to see. The temperature was now elevated for the first time and reached 101.6 F. in the evening. The blood pressure was now 145 systolic and 85 diastolic.

The patient became much worse on August 28 and lapsed into a semicomatose state. A roentgenogram of the thorax revealed bilateral congestion and parenchymal consolidation of the right lung, which were interpreted as indicating pneumonia. Administration of penicillin was started. A roentgenogram of the skull was negative. The concentration of urea had risen to 96 mg. per hundred cubic centimeters of blood and the concentration of chlorides was 611 mg. per hundred cubic centimeters of plasma. The carbon dioxide combining power was 75.8 volumes per cent. The serum bilirubin was 3.8 mg. per hundred cubic centimeters direct and 0.4 mg. per hundred cubic centimeters indirect. The serum lipase was 0.6 cc. of sodium hydroxide per cubic centimeter and the serum amylase was 160 units. There was dye retention, grade 4 (on the basis of 1 to 4, in which 1 designates the least and 4 the greatest retention), by the sulfobromophthalein method. The cerebrospinal fluid was clear with globulin positive; the total concentration of protein was 90 mg. per hundred cubic centimeters; the fluid was negative for blood; lymphocytes numbered 2 per cubic millimeter; the colloidal gold reaction was 0111100000; the initial pressure was 6 cm. of water; the pressure on compression of the jugular veins was successively 28, 10 and 8 cm. of water; the final pressure was 6 cm. of water.

The patient's condition became critical, with the rectal temperature rising to 105.6 F. Coma developed and vomiting continued. The output of urine, which had been good and was recorded as 3,600 cc. on August 28, dropped to 400 cc. on August 29 and to 200 cc. on August 30. The concentration of urea rose to 160 mg. per hundred cubic centimeters of blood and the serum bilirubin was 5.96 mg. per hundred cubic centimeters direct and 2.5 mg. per hundred cubic centimeters indirect on August 29. Death occurred on the morning of August 31 (nineteen days after admission).

At the postmortem examination the following conditions were deemed significant: an adenoma of the right inferior parathyroid (fig. 1); hypertrophy of the kidneys (right 405 Gm., left 400 Gm.); bronchopneumonia (right grade 3, left grade 1); mild icterus; healed duodenal ulcer; focal hemorrhage and infarct of the right cerebellar peduncle; thrombosis of a branch of the right pulmonary artery with calcification of the thrombus.

The adenoma of the right inferior parathyroid measured 3 by 1.5 by 1.7 cm. and weighed 4.12 Gm. It was light brown. The cut surface was also light brown and homogeneous throughout. The remaining parathyroids were normal in size and color.

In the lower lobes of both lungs there were irregular gray regions suggesting pneumonia. There was an antemortem thrombus occluding the pulmonary artery to the right lower lobe.

In the duodenum there was the scar of a healed ulcer located 1 cm. below the pylorus on the posterior surface.

The kidneys were enormous, the two organs together weighing 805 Gm. against a calculated normal of 400 Gm. The surfaces were pale brown and smooth. On section the cortex measured 0.8 cm. in thickness.

Microscopic study revealed the following findings (figs. 2*a* and (*b*). The right inferior parathyroid was composed almost entirely of chief cells. In most regions they were arranged in solid masses, but often they were grouped in small cords and there was a tendency to assume a glandular pattern. Adipose connective tissue cells were practically absent. The stroma was sparse in some regions but more abundant in the glandular portion of the adenoma. Blood vessels were numerous. Only a few groups of oxyphil cells were present. The cytoplasm

of the chief cells was sparse. In only an occasional cell were there deposits of glycogen. The remaining parathyroids were normal.

In the lungs there was bronchopneumonia in both lower lobes. The more striking finding, however, was the widespread calcification of the walls of the small and medium sized arteries (fig. 3). The deposits were in the media and involved the entire

Fig. 3 (case 1).—Calcification of small pulmonary artery and bronchopneumonia. Calcification in the alveolar septums also can be seen (× 160).

circumference of the vessels. There was also a widespread deposition of fine particles of calcium within the alveolar septums. These alveolar deposits were well demonstrated by von Kossa's specific stain for calcium. In the thrombus within the pulmonary artery to the right lower lobe there was pronounced calcification.

In the liver, occasional bile canaliculi were distended with bile thrombi. Atrophy of the central zones was present in a minimal degree.

All sections of the kidneys revealed widespread deposition of calcium within the tubules and within the epithelial cells lining the tubules. In an occasional glomerulus there were deposits of calcium, and rarely a small artery presented medial calcification. One small region of fairly recent infarction was almost completely calcified. Aside from these changes there was no evidence of recent or earlier renal disease.

The former duodenal ulcer was covered by intact mucosa. The pancreas was normal.

In decalcified microscopic preparations of the vertebrae and sternum there were disorganization of architecture and irregular distribution of calcium.

CASE 2.—A white man aged 53, admitted to the Mayo Clinic on June 4, 1945, complained chiefly of epigastric pain and vomiting of two years' duration. In 1942 he had injured his back while employed as a miner. Roentgenographic examination at that time was reported to have revealed a chip fracture of the first and third lumbar vertebrae. Three weeks after this injury, while he was confined to bed, there developed vomiting, unassociated with pain, which persisted for one month. Intermittent epigastric pain continued for two years, occurring two to three hours after meals and relieved with alkali. There had been frequent episodes of vomiting during this time. In the past three months both the pain and emesis had become more severe, the latter not being associated with nausea. For two years there had been nocturia one to two times daily. Recent loss of 10 pounds (4.5 Kg.) had been noticed. For ten days prior to his admission, abdominal pain and severe vomiting had been present.

The patient's temperature was 98 F., pulse rate 96 beats per minute, blood pressure 154/100 to 130/100. His heart, lungs and abdomen were apparently normal. The urine had a specific gravity of 1.015, its reaction was acid and it contained a small amount of albumin but no sugar. Occasional hyaline casts were present. There were 6 leukocytes per high power field. The concentration of hemoglobin was 15.8 Gm. per hundred cubic centimeters of blood; leukocytes numbered 7,800 per cubic millimeter of blood. The Kahn reaction was negative. The concentration of urea was 28 mg. per hundred cubic centimeters of blood. Analysis of the gastric contents gave total acidity 68, free hydrochloric acid 56, no blood. Roentgenographic examination of the thorax was negative. The gastrointestinal roentgenographic studies visualized a duodenal ulcer with a crater but no gastric retention.

An ulcer regimen and administration of aluminum phosphate gel were begun. For three days the patient did well, but then vomiting started and was continuous, even though on some days his diet consisted only of milk. He was hospitalized on June 18 for observation and possible operation.

As the symptoms did not improve with hospital care, operation was advised. On June 30, 1945 gastric resection was done for subacute perforating duodenal ulcer. Three days after operation the concentration of urea had risen to 114 mg. per hundred cubic centimeters of blood, with concentration of chlorides 644 mg. per hundred cubic centimeters of plasma and carbon dioxide combining power 60.7 volumes per cent. The concentration of protein was 6.2 Gm. per hundred cubic centimeters of serum. The patient appeared listless and lethargic. This condition became more severe on July 7. Recurrent and persistent vomiting was again noted. On July 8 he stopped eating, and it was difficult to get him to talk. On gastric lavage there was no retention. The urinary output remained good. On July 9 the patient became semicomatose, and there was evidence of shock. On July 10 he sank into a coma and his temperature rose to 105 F. The blood studies at this time revealed urea 232 mg. per hundred cubic centimeters of blood and carbon dioxide combining power 46.6 volumes per cent. Leukocytes numbered 13,200 per cubic millimeter of blood. The course thereafter was downward. His temperature rose terminally to 106 F., with death on July 10, 1945.

Fig. 4 (case 2).—Posterior view of the organs of the neck, demonstrating hypertrophy of the parathyroid glands. The left superior and inferior parathyroid glands and the two right superior and the right middle parathyroid glands are seen. The esophagus has not been opened. The left lobe of the thyroid is seen.

At the postmortem examination the significant findings were as follows: primary hypertrophy of the parathyroids and of supernumerary parathyroid glands; recent (ten day) partial gastrectomy for perforating duodenal ulcer; terminal bronchopneumonia; multiple calcifications of the dura mater; hypertrophy of kidneys.

The parathyroid glands presented a curious picture (fig. 4). On the left side there were three distinct glands designated as superior, middle and inferior. The left superior parathyroid measured 3.2 by 1.6 by 1.2 cm. From its upper lateral surface there was a tonguelike projection of parathyroid tissue measuring 1.2 by 0.4 by 0.2 cm. The left superior parathyroid with the tonguelike projection weighed 3.37 Gm. The upper part of the main portion was yellow-brown and homogeneous, while the lower third was darker brown and contained small cystlike cavities measuring up to 1 mm. in diameter. The left middle parathyroid measured 1.8 by 0.4 by 0.2 cm. and weighed 0.130 Gm. The left inferior parathyroid measured 0.7 by 0.4 by 0.2 cm. and weighed 0.09 Gm. These two glands appeared grossly like normal parathyroid tissue.

On the right side there were six distinct parathyroid glands. The largest of these, designated right middle parathyroid, showed extreme hypertrophy. It measured 5.7 by 2.0 by 2.7 cm. Its upper pole was pale brown, while the lower pole was dark brown. In it were two cysts filled with serous fluid; the larger one, in the upper pole, measured 2 by 1.5 by 1.5 cm. and the smaller one, in the midportion, measured 1.0 by 1.0 by 0.8 cm. The cyst walls were partially calcified. The gland weighed 14.9 Gm. after the cysts had been emptied. There were two small parathyroid glands lying on the superior and posterior surface of the right middle parathyroid gland but entirely separate from it. They might be designated right superior parathyroid glands. They measured 0.9 by 0.4 by 0.2 cm. and 1.0 by 0.6 by 0.3 cm. and weighed 0.110 Gm. and 0.150 Gm. respectively. Anteriorly and beneath the right middle parathyroid gland were three other distinct parathyroid glands. These might be designated as right inferior parathyroids. The largest two hung grapelike from the main tumor but were separated from it by bands of fibrous connective tissue. They measured 2.0 by 0.9 by 0.4 cm. and 2.0 by 0.6 by 0.4 cm. and weighed 0.730 Gm. and 0.690 Gm. respectively. The remaining right inferior parathyroid gland measured 1.0 by 0.4 by 0.2 cm. and weighed 0.150 Gm. (figs 5 and 6).[16]

Fig. 5 (case 2).—The right middle parathyroid gland; two cysts are seen in the upper and middle poles.

The total amount of parathyroid tissue in this case weighed 20.32 Gm. as against a normal weight of about 0.14 Gm. I cannot find comparable reports in the literature of this number of supernumerary parathyroid glands.

In the lower lobe of the right lung there was increased consistency with corresponding decreased crepitation.

Two large ulcers were found in the duodenum, perforating on the pancreas.

The kidneys were pink-brown. The right weighed 250 Gm. and the left 290 Gm. There were many small adenomas measuring 1 to 4 mm. in diameter. Numerous peripelvic and parenchymatous cysts measuring from 1 to 2 mm. were present in both kidneys. Postmortem roentgenographic examination revealed diffuse nephrocalcinosis with the calcified regions measuring 1 to 2 mm.

There was calcification of the dura mater along the superior sagittal sinus and falx extending 1 to 1.5 cm. on each side. Small metastatic nodules of calcification up to 2 cm. in diameter were present on the inner surface of the dura mater.

The microscopic findings were as follows: All parathyroid tissue was composed of essentially the same type of large, clear cell (wasserhelle cell, described by Getzowa [17]) (fig. 8 *a* and *b*). The description of the cell fits well with that given by Castleman and Mallory and will be quoted:

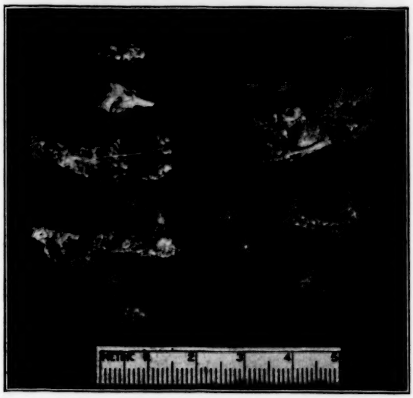

Fig. 6 (case 2).—Parathyroid glands; the right middle parathyroid gland is not shown; illustrated on the left are the right superior and right inferior glands and on the right the left superior, middle and inferior glands.

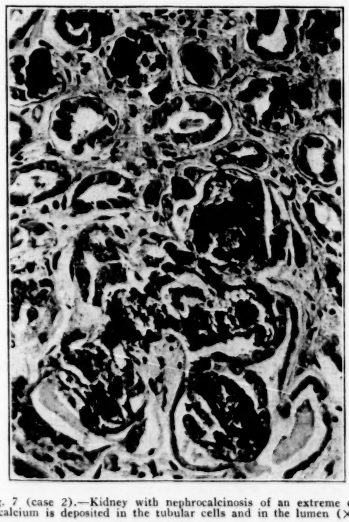

Fig. 7 (case 2).—Kidney with nephrocalcinosis of an extreme degree. The calcium is deposited in the tubular cells and in the lumen (× 235).

"The wasserhelle cell is polyhedral in shape, sharply demarcated by a thin basophilic membrane and varies from 10 to 40 microns in diameter, averaging 15 to 20 microns. Many

16. Irregular surfaces with pseudopod-like projections from the parathyroid glands have been recorded (Castleman and Mallory,[15] Cope [18]), but in this instance connection between the glands could be demonstrated only with the left superior parathyroid.

17. Getzowa, Sophia: Ueber die Glandula parathyreoidea, intrathyreoideale Zellhauben derselben und Reste des postbranchialen Körpers, Virchows Arch. f. path. Anat. **188:** 181-235, 1907.

of the cell boundaries are broken with resultant fusion, similar to the alveoli in pulmonary emphysema. In contrast to the variability in the size of the cells the nuclei, though often multiple, are round to slightly ovoid in shape, sharply outlined and moderately hyperchromatic with an eccentrically placed nucleolus. As a rule the nuclei are located in the end of the cells, that is contiguous to the stroma. This produces a characteristic pattern which resembles a branch of berries. The cytoplasm is clear except for a little light pink staining granular material. Many of their tiny granules are glycogen deposits. Similar granules are present within the nuclei. There is no fat except for a rare droplet in the stroma. The low power appearance of the histological sections is so similar to that of clear renal cell carcinomas that distinction would be difficult if the source were not known. The stroma is composed of thin fibrinous connective tissue bands containing a moderate number of connective tissue cells and relatively few blood vessels. Their bands surround small and large groups of cell, producing a pseudoglandular effect. This effect is further emphasized by the position of the nuclei as mentioned above. Occasionally a true single layered alveolus is seen. No oxyphil or chief cells are found. There are no mitoses."

In addition to the constancy of the large clear cell throughout all glands, the polarity of the nucleus was the next most constant feature. In the vast majority of the cells the nucleus occupied a position in the end of the cell nearest the stroma. A few cells had pink-staining granules within the cytoplasm. The diameter of the cells varied from 10 to 30 microns, with an average of 20 microns. Hyperplasia was self evident. The connective stroma was for the most part sparse, but in a few regions it was abundant. Glandular grouping was very commonly seen. At times the cells were grouped in cordlike formation, and cysts of various sizes were frequent. Adipose connective tissue cells were absent. Blood vessels were numerous. There was some variation in staining between the cells in a single gland and between those in other glands.

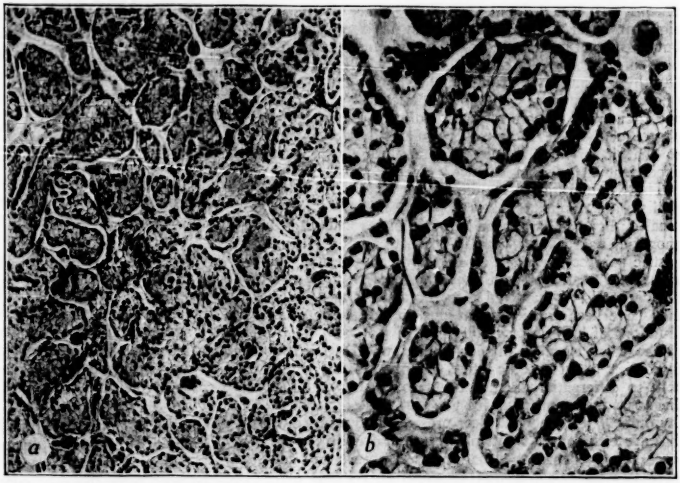

Fig. 8 (case 2).—*a*, hyperplasia of the parathyroids showing large clear cells in pseudoglandular grouping; the polarity of the nuclei is well illustrated (× 120). *b*, large cell hyperplasia of the parathyroids (× 350).

There were bronchitis and bronchopneumonia in the lower lobe of the right lung. A few deposits of calcium were present within the alveolar septums.

In the liver a moderate degree of central atrophy with necrosis was present. Bile canaliculi were dilated and filled to an unusual degree with bile thrombi.

In the pancreas, in an occasional duct, there was squamatization, while others had slightly distended lumens. There were focal hydropic changes in numerous groups of acinar cells.

In the duodenum the ulcers were active and penetrated onto the head of the pancreas.

All sections of the kidneys revealed numerous deposits of calcium in the epithelial cells and in the lumen of the tubules (fig. 7). In some regions the deposits of calcium had produced necrosis of the tubular cells. In an occasional glomerulus there was slight proliferation of the cells of Bowman's capsule, while a rare glomerulus was partially or completely fibrosed. There was dilatation of the tubules in a few regions. Numerous small "adenomas" were present in both kidneys.

In decalcified microscopic sections of the vertebrae, sternum and ribs the trabeculae were thinned but no cysts or osteoblastic activity was seen.

COMMENT

In the first of these 2 cases of probable acute hyperparathyroidism with coexisting duodenal ulcer the condition was due to an adenoma of the parathyroid gland, composed of chief cells, and there was metastatic calcification in the kidneys, lungs and small arteries. In the second case the condition was due to generalized hypertrophy of the parathyroids and of supernumerary parathyroid glands with hyperplasia of the large, clear cell type. Metastatic calcification was found in the kidneys and the dura mater. The number of supernumerary parathyroids is unusual, and the total amount of parathyroid tissue present in this case showed hypertrophy and hyperplasia to an extreme degree. These 2 cases illustrate well the pathologic changes of the parathyroid gland in hyperparathyroidism. In a review by Castleman and Mallory [18] two distinct changes were emphasized. There may be enlargement of a single gland or adenoma of a parathyroid gland. The adenoma is composed of chief cells or any combination of chief cells with oxyphil cells or large clear cells. Secondly there may be hypertrophy of four parathyroid glands. The significance of primary hypertrophy was first emphasized by Albright and his associates [19] and recently by Cope.[20] In this type of primary hypertrophy and hyperplasia of the parathyroids there is a consistent histologic picture; the cells are all of large clear cell type (wasserhelle). The second case in this report is the first

18. Castleman, Benjamin, and Mallory, T. B.: The Pathology of the Parathyroid Gland in Hyperparathyroidism: A Study of 25 Cases, Am. J. Path. **11**: 1-72 (Jan.) 1935.

19. Albright, Fuller; Bloomberg, Esther; Castleman, Benjamin, and Churchill, E. D.: Hyperparathyroidism Due to Diffuse Hyperplasia of All Parathyroid Glands Rather than Adenoma of One: Clinical Studies on 3 Such Cases, Arch. Int. Med. **54**: 315-329 (Sept.) 1934.

20. Cope, Oliver: Hyperparathyroidism: The Significance of Generalized Hyperplasia: Report of the Seventh Case, Clinics **1**: 1168-1178 (Feb.) 1943.

recorded case of primary hypertrophy from the Mayo Clinic.

Attention is called to changes of a nonspecific nature present in both cases. In the liver there was atrophy of the central zones. The bile canaliculi were distended to an unusual degree with bile thrombi. Bronchopneumonia was present as a terminal factor.

A portion of the kidney was analyzed for calcium in each case. It was found to contain 0.743 mg. per gram of wet tissue and 4.334 mg. per gram of dry tissue in case 1 and 0.899 mg. per gram of wet tissue and 4.174 mg. per gram of dry tissue in case 2. For control a normal kidney was examined by chemical methods and found to contain 0.0579 mg. per gram of wet tissue and 0.24 mg. per gram of dry tissue.

The existence of hyperparathyroidism in these cases might be questioned in view of the absence of confirmatory laboratory work. However, the findings at necropsy of parathyroid enlargement, the history, the renal changes and the metastatic calcifications are unequivocal. Castleman and Mallory [18] have stated that rigid proof of hyperparathyroidism is often lacking, but in cases of pronounced parathyroid enlargement the burden of proof rests on the disclaimer. That hyperparathyroidism may produce renal lesions in the absence of osseous changes is well known. The osseous changes are thought to be an indication of the duration and degree of the disease as well as of the dietary habits; so that it is probable that osteitis fibrosa cystica is dependent on calcium balance.[21]

The gastrointestinal manifestations of hyperparathyroidism are not as well known as are the osseous and renal changes. Gutman and his associates [22] described anorexia, nausea and vomiting, constipation and epigastric pain occurring in cases of hyperparathyroidism and stated that, "while these symptoms may suggest the diagnosis of duodenal ulcer or acute appendicitis, they have been considered as due to the toxic manifestations of hyperparathyroidism."

The coexistence of duodenal ulcer with hyperparathyroidism presents some interesting problems in regard both to differential diagnosis and to treatment. The diagnosis is complicated by the fact that hyperparathyroidism and duodenal ulcer present many symptoms that are common to the two diseases and their coexistence may obscure the diagnosis. Gutman and his associates have stated that hyperparathyroidism may itself produce symptoms that resemble those of duodenal ulcer. As seen from the cases presented, duodenal ulcers may actually exist with hyperparathyroidism. This coexistence has not been noted previously. When hyperparathyroidism and duodenal ulcers exist together, vomiting may be the manifestation of either one. However, if intractable vomiting occurs with duodenal ulcer in the absence of demonstrable gastric retention, it might suggest the presence of hypercalcemia and in turn hyperparathyroidism. This diagnosis is even more suggestive if the vomiting is aggravated by the institution or the continuation of an ulcer regimen with a diet high in calcium and phosphorus. Anorexia, when present, is in favor of hyperparathyroidism. The occurrence of muscular weakness and lethargy is secondary to the effects of hypercalcemia and, when associated with vomiting, may offer assistance in the diagnosis of hyperparathyroidism. In the 2 cases the presenting symptoms were those of duodenal ulcer, but in retrospect the vomiting aggravated by diet and medication with associated weakness and lethargy was probably the result of hypercalcemia. With coexisting hyperparathyroidism and duodenal ulcer in a patient whose principal complaints seem to be due to a duodenal ulcer, the cause is inevitably and irretrievably lost if the physician is not lucky enough to think of hyperparathyroidism.

The treatment of duodenal ulcer, if complicated by hyperparathyroidism, offers many difficulties. The reverse also is true. The danger of a high calcium intake in cases of hyperparathyroidism was suggested by Hunter and Aub [23] and the greater danger of high phosphorus intake was brought out by Albright, Bauer, Claflin and Cockrill.[24] Albright [1] now recommends a diet with a low calcium intake in cases of severe hyperparathyroidism and states that "if the serum calcium is near the critical level where a slight increase in it would precipitate parathyroid poisoning it may so happen that a diet high in calcium would make the difference." In the cases reported, the prescribed diet contained a daily calcium intake of 1.87 Gm. and a daily phosphorus intake of 1.56 Gm. This, compared with the daily calcium requirement of 0.80 Gm. as recommended by the National Research Council, and the average phosphorus intake of 1.40 Gm. of the adult male,[25] is greater than normal. An additional source of calcium and phosphorus intake to be considered is the medication. The standard Sippy powder contains calcium carbonate. Other drugs used in the treatment of duodenal ulcer, such as tribasic calcium phosphate, may add to the intake of these minerals. It is conceivable that such a diet might easily aggravate preexisting hyperparathyroidism with the production of parathyroid poisoning. Furthermore, medication may further aggravate the condition, and any medication that produces an alkaline urine may favor the precipitation of calcium phosphate in the renal tubules in cases of hyperparathyroidism.

SUMMARY

In neither of 2 cases of probable acute hyperparathyroidism not recognized during life did the history suggest osseous or renal disease. The presenting symptoms in each were those of coexisting duodenal ulcer and probable hypercalcemia. Treatment for duodenal ulcer, including a diet high in calcium and phosphorus, produced in each instance an exacerbation of symptoms: nausea, vomiting, lethargy, prostration and azotemia.

In the first case acute hyperparathyroidism was due to an adenoma of the parathyroid gland. In the second case it was associated with primary wasserhelle hyperplasia of the parathyroids and of supernumerary parathyroids. The latter case is the first reported instance of primary hyperplasia of the parathyroid glands from the Mayo Clinic. Metastatic calcification was present in the kidneys in both cases and involved the lungs and arterioles in case 1 and the dura mater and lungs in case 2.

21. Albright, Fuller; Baird, P. C.; Cope, Oliver, and Bloomberg, Esther: Studies on the Physiology of the Parathyroid Glands: IV. Renal Complications of Hyperparathyroidism, Am. J. M. Sc. **187:** 49-65 (Jan.) 1934.

22. Gutman, A. B.; Swenson, P. C., and Parsons, W. B.: The Differential Diagnosis of Hyperparathyroidism, J. A. M. A. **103:** 87-94 (July 14) 1934.

23. Hunter, Donald, and Aub, J. C.: Lead Studies: XV. The Effect of the Parathyroid Hormone on the Excretion of Lead and of Calcium in Patients Suffering from Lead Poisoning, Quart. J. Med. **20:** 123-140 (Jan.) 1927.

24. Albright, Fuller; Bauer, Walter; Claflin, Dorothy, and Cockrill, J. R.: Studies in Parathyroid Physiology: III. The Effect of Phosphate Ingestion in Clinical Hyperparathyroidism, J. Clin. Investigation **11:** 411-435 (March) 1932.

25. Clark, G. W.: Studies in the Mineral Metabolism of Adult Man, Univ. Calif. Publ. Physiol. **5:** 195-287 (June 19) 1926.

Clinical Notes, Suggestions and New Instruments

FOREIGN BODY (CASE KNIFE) IN THE SIGMOID

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and
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Pittsburgh

Foreign bodies in the sigmoid are rather infrequent, while foreign bodies in the rectum are reported more often. Foreign bodies in the rectum are usually inserted accidentally, at other times inserted as prankish debauches. Frequently sexual perverts stimulate this erogenous zone with various foreign bodies, which occasionally slip up into the rectum beyond their grasp. This was the circumstance in the case presented.

Various types and assortment of solid foreign bodies in the rectum have been reported. Sharon[1] reports the removal of a tall mustard or pickle jar, 14 cm. in height and 17.5 cm. in circumference, from the rectum of a man aged 54. Clark[2] removed a thermometer accidentally lost in the rectum of a boy baby aged 11 months. Hubrich[3] removed a woman's hairpin lying crosswise in the rectal ampulla in a boy aged 13 years. The hairpin had been inserted in the rectum a month previously. Hubrich stated that "thought should be given to the possibility of a foreign body in treating all cases of chronic constipation." Alley[4] removed a 30 watt frosted glass electric light bulb from the rectum of a grandfather aged 52 with, as he expressed it, "only slight damage to the patient." Chisholm[5] reported an unusual foreign body in the rectum and sigmoid in the form of an "iron rod approximately ½ inch in diameter which was bent upon itself in its upper half to form a handle. Its overall length was 13½ inches and the handle portion, which was uppermost in the bowel, was 2¾ inches wide. The object is technically known as a 'tuck pointer' and is used by masons in smoothing the mortar between rows of brick." This object was removed by laparotomy, an opening being made in the descending colon, with uneventful convalescence.

Rosser[6] mentioned five examples of foreign bodies removed by him, namely (1) a five cent piece, swallowed five years previously, from a young woman with a congenital vaginal anus when he constructed an anal outlet; (2) a thermometer from a 4 year old child; (3) a 6 inch sauce bottle from a young male college student; (4) a 40 watt Mazda electric globe from a man aged 60 and (5) an enema tip.

One of us (A. M. V.) removed an enema tip which accidentally became detached while the patient was taking an enema. The tip was impinged by lying crosswise in the rectum. Under general anesthesia the tip was successfully removed.

Meagher[7] reported the removal of a drinking glass 4 inches high, 2⅛ inches across the bottom and 2⅝ inches across the top from the rectum of a sexual pervert.

Smiley[8] removed a glass tumbler surgically, resulting in death sixteen hours later.

Warren[9] removed a fish hook from a man aged 60 who two days previously had eaten several jellied eels. He also considered the possibility of its presence as an extraordinary weapon for use in anal eroticism.

Hawe[10] removed surgically with a colostomy a jam jar 2½ inches in diameter at its base and 3 inches high, with recovery.

Hartwig[11] removed a rough irregular stick, 11 inches long from the rectum. It presented a tumor mass in the region of the gallbladder and did not penetrate the bowel wall, probably because of the existence of a long mesosigmoid, as was likewise found in our case, in which the tumor mass was to the right of the umbilicus (fig. 1).

Glendon[12] removed a jelly glass by surgical laparotomy, with recovery.

Gillespie[13] removed a petrolatum bottle and Pretty[14] an ink bottle rectally.

Cleghorn[15] removed a 10 inch ice pick by laparotomy, with death on the tenth postoperative day.

Ball[16] removed a listerine bottle rectally by a loop made from a wire coat hanger.

Macht[17] removed a "seven-up" bottle from an American sailor and stated that until then this was the eighth recorded case in which a bottle was present in the rectum. According to Macht, the most remarkable foreign bodies reported in the literature up to 1943 were a snuff box, whisky glasses, a 30 cm. mortar pestle, ox horns, electric light bulbs, an ink bottle, petrolatum bottle, cold cream jar, a lemon, an apple, chicken bones, a glass tube, portions of a broom handle, frozen pig's tail, and most unusual of all (cited by Macht) was "a tool box containing a piece of gun barrel, a screw driver, two hack saws, a boring syringe, a file, several coins, thread and tallow. The tool box and its contents were removed from a prisoner who made his escape through death from obstipation. At autopsy the tool kit was found to have migrated into the transverse colon."

Fig. 1.—Nine inch case knife removed from sigmoid colon via rectum. The blunt end was pointed cephalad.

REPORT OF CASE

V. S., a white man aged 25, entered Cook County Hospital, Chicago, at 9:50 p. m., Oct., 12, 1944, with an admitting room diagnosis of umbilical hernia. His present complaint was pain in the abdomen for eighteen hours.

He gave a history that while lifting a packing box weighing 150 pounds (68 Kg.) at 3:15 a. m., October 12, suddenly everything "let loose" inside his stomach and he immediately was seized with a severe, sharp, "knife like" pain in the region of the umbilicus, causing him to drop the box. He returned home by street car and after he had lain in bed for one and one-half hours the pain seemed to disappear for several hours. When he got up and attempted to go down stairs the pain returned but again disappeared after lying down for a while. He went to his employer to receive his pay check and again the pain returned. He consulted the plant physician, who

From the Department of Surgery, Loyola University School of Medicine and Cook County Hospital (Dr. Vaughn), Chicago.

1. Sharon, James P.: Unusually Large Foreign Body in Rectum, J. Iowa M. Soc. **16:** 411 (Sept.) 1926.
2. Clark, F. H.: Thermometer Lost in Rectum, Arch. Pediat. **44:** 784 (Dec.) 1927.
3. Hubrich, R.: Foreign Body in the Rectum, Deutsche med. Wchnschr. **54:** 476 (March 23) 1928.
4. Alley, Rufus C.: Unusual Foreign Body in Rectum, Kentucky M. J. **35:** 67 (Feb.) 1937.
5. Chisholm, A. J.: Foreign Bodies of the Rectum, Rocky Mountain M. J. **40:** 250 (April) 1943.
6. Rosser, Curtice: Foreign Bodies of the Rectum, Texas State J. Med. **27:** 23-24, 1930.
7. Meagher, John F. W.: An Unusual Foreign Body in the Rectum, New York M. J. **114:** 346, 1921.
8. Smiley, Orvall: Glass Tumbler in Rectum, J. A. M. A. **72:** 1285 (May 3) 1919.
9. Warren, C. P.: Foreign Body (Fish Hook) in Rectum, Brit. M. J. **2:** 638 (Sept. 25) 1937.
10. Hawe, Philip: Jam Jar in Rectum, Brit. M. J. **2:** 937, 1928.
11. Hartwig, Marcell: Unique Case of Foreign Body in Rectum, J. A. M. A. **77:** 1654 (Nov. 19) 1921.
12. Glendon, W. P.: Foreign Body in the Rectum, J. M. Soc. New Jersey **23:** 143, 1926.
13. Gillespie, W. F.: Vaseline Bottle in the Rectum, Canad. M. A. J. **31:** 302 (Sept.) 1934.
14. Pretty, H. G.: An Ink Bottle in the Rectum, Canad. M. A. J. **31:** 302 (Sept.) 1934.
15. Cleghorn, Charles D.: Foreign Body in the Rectum, Am. J. Roentgenol. **19:** 291 (March) 1928.
16. Ball, Ralph G.: Foreign Body in Rectum, J. Kansas M. Soc. **29:** 218, 1928.
17. Macht, Stanley H.: Foreign Body (Bottle) in Rectum, Radiology **42:** 500 (May) 1944.

advised hospitalization. En route to the hospital via street car the pains became so severe that he was compelled to get off the car and sit on the curb. A passing motorist came to his assistance and brought him to the hospital. After lying in bed for a while the pain gradually disappeared.

The history revealed no nausea, vomiting, constipation, diarrhea nor melena past or present. He experienced, however, attacks of "heartburn" following the ingestion of fatty foods as pork and sausage.

On the day of admission he first noticed a small, hard tender "knot" just to the left of the umbilicus.

The family history revealed that his mother and one sister had died of tuberculosis. One living sister had tuberculosis and one living brother had been insane all his life.

The patient had lost 36 pounds (16 Kg.) since being discharged from the Army in September 1943 because of arthritis of the spine and poor eyesight. Eight years before admission he suffered for four months with rheumatism. He stated that he did not have a venereal disease. He said that he drank 1½ gallons of beer daily with a couple of "shots" of whisky and masturbated one or two times daily. He was rather uncommunicative and sullen and offered no information which would have guided us toward a correct diagnosis.

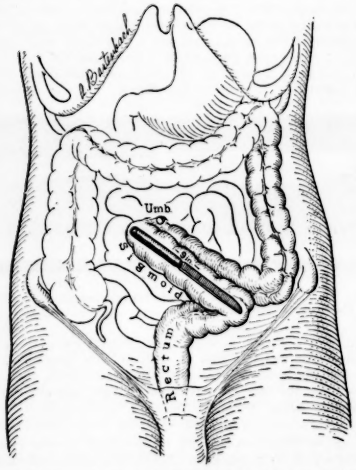

Fig. 2.—Diagrammatic sketch showing position of knife in sigmoid colon. Note the long mesosigmoid, which enabled the knife to assume this position.

On physical examination the patient appeared moderately well developed, listless and in no acute distress. His rectal temperature was 99.8 F., pulse rate 68, respiratory rate 16 and blood pressure 112/65. A systolic heart murmur at the apex was heard and was transmitted over the entire precordium. In the abdomen a small 1 by 1 cm. hard, tender nodule, not hot nor red, was noted to the left of the umbilicus, giving the appearance of a periumbilical hernia. No other masses were palpable. The abdomen was soft. The peristaltic sounds were normal. There was no distention and no inguinal nor femoral hernia present. Rectal examination was negative. No masses were felt as far as the examining finger could reach.

The urine and blood were normal.

The impression was one of (1) umbilical hernia with incarcerated omental tab; (2) rheumatic heart disease, with mitral regurgitation and cardiac enlargement.

The patient was seen and examined by the night surgeon and the night surgical resident on call at 3 a. m., October 13. They did not consider the case a surgical emergency, but advised observation. At 9 a. m. on the same day the surgical resident in the ward (J. A. M.) examined the patient and made the following notations:

"Patient has a small hard, painful, freely movable nodule just to the right of the umbilicus. No obstructive signs or symptoms: I believe this to be a rectus sheath herniation. Should be explored in the next few days."

A progress note on October 14 stated "Hard knot near umbilicus still present: It is very tender but freely movable over an area of 5-10 cm. square about umbilicus."

The following week the patient had no complaints unless the mass was palpated. The bowel movements were normal on general diet. There was no distention. Rectal examination was negative. Surgical exploration of the tender nodule was advised.

A preoperative diagnosis of umbilical hernia with incarcerated omental tab was made and the patient was operated on under general anesthesia on October 23. A transverse incision was made below and to the right of the umbilicus. The sheath of the rectus abdominis was split about 4 inches at the lateral border and the muscle retracted medially. The mass was found to be intra-abdominal and the peritoneum was cut longitudinally long enough to admit the hand. A long hard mass was found in the lumen of the redundant sigmoid lying obliquely in the lower abdomen to the right of the umbilicus and pointing left toward the middle of the inguinal ligament. The mass was carefully manipulated and milked down the sigmoid into the rectum, where an assistant was able to grasp the tip and with gentle pressure from above and traction below the mass was removed via the rectum and found to be a 9 inch table or case knife (fig. 1).

The abdominal wall incision was closed in layers. The patient made an uneventful recovery and was discharged from the hospital on the eleventh postoperative day.

SUMMARY

Rectal examination will detect foreign bodies in the rectum but may fail to do so when they have ascended into the sigmoid or higher. In this case report rectal examination was negative, owing to the fact that the knife had ascended into the sigmoid and occupied an oblique position in the lower part of the abdomen (fig. 2). Owing to wartime scarcity of x-ray films, when only x-rays of the most urgent cases are ordered, no x-rays were taken. In normal times a scout plate would have been taken and a definite diagnosis obtained.

Surgical removal by laparotomy either by opening the colon or by directing the foreign body downward toward the anus is in many instances necessary. The mortality is greatly increased when the colon is opened, but with the advent of succinylsulfathiazole it is hoped and expected that the rate will be greatly lowered. Laparotomy alone gives a very low mortality.

In reviewing the literature we were unable to find a similar case of foreign body in the sigmoid or rectum.

The irony of this case was the fact that the complaint on admission was a "knife like" pain in the abdomen. How true this proved to be on opening the abdomen eleven days later!

CONCLUSIONS

1. Foreign bodies in the sigmoid may pass unrecognized by rectal examination.

2. A long mesosigmoid may allow the foreign body to ascend high within the abdominal cavity.

3. A foreign body in the sigmoid must be differentiated in cases of freely movable lower abdominal tumors.

4. Fatalities may occur in removing foreign bodies from the sigmoid surgically.

5. A history is not always realiable, especially in patients by whom the foreign body was used as an instrument of sexual perversion.

30 North Michigan Avenue.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

BACTERIAL VACCINE MADE FROM HEMOPHILUS PERTUSSIS.— Pertussis vaccine.— Whooping cough vaccine.—A sterile suspension of killed pertussis bacilli (Hemophilus pertussis) of one or more strains showing the characteristics of phase I as described by Leslie and Gardner. The suspension is contained in isotonic solution of sodium chloride or other suitable diluent. The vaccine may be dispensed as a simple suspension, commonly known as "plain vaccine," or as an alum precipitated or aluminum hydroxide adsorbed suspension. The vaccine shall contain in each cubic centimeter not less than 10 billion organisms. The vaccine may be dispensed by itself or in combination with one or more other antigens, provided the combination does not lessen the antigenic value of the pertussis vaccine or otherwise make the product unsuitable for human use.

Actions and Uses.—Well controlled field studies indicate that pertussis vaccine possesses sufficient antigenic value to afford considerable protective value against whooping cough. The effect in lowering the death rate is even more striking than its effect in preventing an attack of the disease, since cases do occur in spite of the previous injection of vaccine, but such cases are usually less severe.

Dosage.—The most satisfactory dose has not been established adequately. In general, the vaccine when used as a plain vaccine should contain not less than 15 billion organisms per individual injection, with the total dose representing at least 45 billion, preferably much more. When used as precipitated vaccine the individual injection should contain not less than 10 billion organisms, with a total dose of 30 billion or more organisms. Pending more complete knowledge it is suggested that the user be guided by the dosage recommendation given on the manufacturer's product, since this represents the dosage accepted by the investigators whose methods have been used in preparing the vaccine.

CUTTER LABORATORIES, BERKELEY, CALIF.

Pertussis Vaccine Phase I Concentrate: 5 cc., 20 cc. and 50 cc. vials. H. pertussis 20,000 million per cubic centimeter. Preserved with phenol 0.25 per cent and merthiolate 0.002 to 0.005 per cent.

THE NATIONAL DRUG COMPANY, PHILADELPHIA

Pertussis Vaccine (Double Strength): 6 cc. vial (one immunization), 12 cc. vial (two immunizations) and 25 cc. vial (four immunizations). H. pertussis 20,000 million per cubic centimeter. Preserved with merthiolate 1: 10,000.

SHARP & DOHME, INC., GLENOLDEN, PA.

Pertussis Bacterin "H" Strength: 5 cc. and 20 cc. vials. 20,000 million H. pertussis per cubic centimeter. Preserved with phenol 0.5 per cent.

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Pertussis Vaccine (Single Strength): 24 cc. vials. 20,000 million H. pertussis per cubic centimeter. Preserved with phenol 0.5 per cent.

Pertussis Vaccine (Double Strength): 5 cc. and 20 cc. vials. 20,000 million H. pertussis per cubic centimeter. Preserved with phenol 0.5 per cent.

PERTUSSIS VACCINE ALUM PRECIPITATED.—A bacterial vaccine prepared from alum precipitated, killed H. pertussis.

Actions and Uses.—Same as Bacterial Vaccine made from H. pertussis.

Dosage.—Three 1 cc. subcutaneous injections of 10,000 million or 15,000 million H. pertussis at three to four week intervals.

THE NATIONAL DRUG COMPANY, PHILADELPHIA

Pertussis Vaccine (Alum Precipitated): 3 cc. vial (one immunization) and 10 cc. vial (three immunizations). 10,000 million H. pertussis per cubic centimeter. Preserved with merthiolate 1: 10,000.

PERTUSSIS VACCINE COMBINED WITH DIPHTHERIA TOXOID.—A combination of pertussis vaccine with diphtheria toxoid.

Actions and Uses.—Employed in the simultaneous immunization of susceptible persons against diphtheria and whooping cough.

Dosage.—Three doses of 1 cc. at three to four week intervals.

THE NATIONAL DRUG COMPANY, PHILADELPHIA

Diphtheria-Pertussis Combined Vaccine (Alum Precipitated): Three 1 cc. vials (one immunization) and three 5 cc. vials (five immunizations). 10,000 million H. pertussis, 0.5 cc. diphtheria toxoid immunizing dose. Preserved with merthiolate 1: 10,000.

SHARP & DOHME, INC., GLENOLDEN, PA.

Diphtheria-Pertussis Antigens Combined (Alum Precipitated): 10 cc. vials (three dose immunizations). 10,000 million H. pertussis diphtheria toxoid immunizing dose. Preserved with phenol 1: 50,000.

PERTUSSIS VACCINE COMBINED WITH DIPHTHERIA AND TETANUS TOXOIDS.—A combination of pertussis vaccine with diphtheria toxoid and tetanus toxoids.

Actions and Uses.—Employed in the simultaneous immunization of susceptible persons against whooping cough and diphtheria.

Dosage.—Three subcutaneous injections of 1 cc. at three to four week intervals.

THE NATIONAL DRUG COMPANY, PHILADELPHIA

Diphtheria-Tetanus-Pertussis Combined Vaccine (Alum Precipitated): Three 1 cc. vials (one immunization) and three 5 cc. vials (five immunizations). 10,000 million H. pertussis, diphtheria toxoid and tetanus toxoid 0.33 cc. each per cubic centimeter. Preserved with merthiolate 1: 10,000.

CONTRACEPTIVE JELLIES AND CREAMS (See New and Nonofficial Remedies, 1945, p. 355).

The following article has now been accepted:

EATON LABORATORIES, INC., NORWICH, N. Y.

Lorophyn Jelly: A water soluble jelly formed from tragacanth and purified Irish moss, having a p_H of 7.5, prepared from the formula:

	Per Cent
Phenylmercuric acetate	0.05
Polyethylene glycol of mono iso octyl phenyl ether	0.3
Gum tragacanth	1.8
Purified Irish moss	2.0
Glycerin	8.0
Methyl p-hydroxy benzoate	0.05
Sodium borate U. S. P.	3.0
Water	84.8

Actions and Uses.—See article Contraceptive Jellies and Creams.

Dosage.—5 cc.

SYRINGE APPLICATORS FOR CONTRACEPTIVE JELLIES AND CREAMS (See New and Nonofficial Remedies, 1945, p. 357).

The following article has now been accepted:

EATON LABORATORIES, INC., NORWICH, N. Y.

Lorophyn Jelly Applicator: A transparent plastic syringe threaded at the blunt, intravaginal end, to screw onto the tubes of jelly, to permit filling by compression of the tube. The full capacity is 5 cc., the recommended dose.

HEXAVITAMIN (See THE JOURNAL, Aug. 11, 1945, p. 1099).

The following dosage form has been accepted:

THE WM. S. MERRELL CO., CINCINNATI

Tablets Hexavitamin: Each tablet contains 2,500 U. S. P. units of vitamin A, 200 U. S. P. units of vitamin D, 1 mg. of thiamine hydrochloride, 1.5 mg. of riboflavin, 37 mg. of ascorbic acid and 10 mg. of nicotinamide.

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1945, p. 428).

The following dosage forms have been accepted:

BRISTOL LABORATORIES, SYRACUSE, N. Y.

Diethylstilbestrol (in Sesame Oil): 0.2 mg. per cc.; 0.5 mg. per cc.; 1.0 mg. per cc.; 2.0 mg. per cc. and 5.0 mg. per cc.: 1 cc. ampuls and 30 cc. vials. Preserved with 0.005 Gm. chlorobutanol.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 5, 1946

MEDICAL APPOINTMENTS IN THE VETERANS ADMINISTRATION

Announcement of the appointments of consultants to veterans' hospitals, including members of the faculties of the leading medical schools which are cooperating with the Veterans Administration, has aroused anxiety among physicians still in the armed forces as to the possibility that all the available places may be filled before their release from the service. THE JOURNAL is informed by the administrators of the Veterans Administration that not all the places have been filled by any means and that there will be opportunities for practically all the well qualified men who wish to serve for several years to come. In areas not associated with medical schools, appointments will be made directly from Washington.

Recently THE JOURNAL published an announcement from the Surgeon General of the U. S. Public Health Service indicating that many positions are vacant in that organization. The Army Medical Department has available many positions for physicians who have been in the service, and the Navy is currently determining how many of its reserve officers will accept permanent appointments.

Elsewhere in this issue appear two statements relative to the Veterans Administration which should be read carefully by all who are interested in taking part in this work. The Veterans Administration is especially anxious to secure the services of physicians with neuropsychiatric training or who may be especially interested in neuropsychiatry and willing to take graduate study in this field. The legislation establishing a division of medicine in the Veterans Administration has been passed by the House and the Senate and will no doubt be signed by the President. An analysis of the legislation published in this issue of THE JOURNAL indicates the opportunities available both in full time and in consultant capacities. Applications may be made directly to the Veterans Administration in Washington, D. C.

PRECURSORS OF THE PORPHYRINS

The question of the identity of chemical substances used in the formation of the porphyrins in the body has been a matter of speculation for many years. The problem is important in medicine because a number of respiratory pigments, including hemoglobin, the cytochromes and catalase, contain the porphyrin group. Furthermore, it is conceivable that an impairment of porphyrin formation might be responsible for some clinical anemias and that a derangement of normal porphyrin formation may occur in such clinical conditions as congenital porphyria and other types of porphyrinuria in man. Thus an understanding of the manner in which porphyrin is formed in the organism becomes of practical importance.

From the classic chemical studies of Hans Fischer,[1] a Nobel laureate, it has been found that porphyrins may be synthesized in vitro from rather simple starting materials such as aminoacetic acid and formyl acetone. Also the fact that the porphyrins contain four pyrrole rings suggests that one or more amino acids, perhaps including proline, are probably involved in porphyrin synthesis in vivo. Evidence that this is the case has been reported in a recent paper [2] indicating that the excretion of porphyrin in the feces of rats is diminished in animals fed a diet low in protein. An anemia develops concomitantly. If porphyrin excretion is an index to porphyrin synthesis under these conditions, it follows that porphyrins are synthesized in the rat from amino acids derived from dietary protein.

Substantiation and extension of this observation have been reported [3] in direct studies on a human subject using the isotope tracer technic. The subject was given aminoacetic acid which contained isotopic nitrogen. Blood samples were withdrawn at intervals for ninety-nine days, and the porphyrin derivative hemin was crystallized and analyzed for isotopic nitrogen content. A relatively high value was obtained, thus demonstrating the participation of aminoacetic acid in the synthesis of porphyrin in the human subject.

Using a similar technic in rats, the Columbia University investigators found that neither leucine [4] nor ammonia [5] was directly concerned with porphyrin synthesis, whereas acetic acid [6] (fed as deuterio acetate) was used for this purpose, since it appeared in the isolated hemin crystals.

The foregoing observations thus indicate that the porphyrins are synthesized in the organism from relatively simple chemical substances, including aminoacetic acid

1. Fischer, H., and Kiele, K.: Annalen **468:** 98, 1929. Fischer, H., and Fink, H.: Ztschr. f. physiol. Chem. **280:** 123, 1944.
2. Orten, J. M., and Keller, J. M.: Fed. Proc. **4:** 100, 1945.
3. Shemin, David, and Rittenberg, David: J. Biol. Chem. **159:** 567 (July) 1945.
4. Schoenheimer, Rudolf; Ratner, S., and Rittenberg, David: J. Biol. Chem. **130:** 703 (Oct.) 1939.
5. Rittenberg, David; Schoenheimer, Rudolf, and Keston, A. S.: J. Biol. Chem. **128:** 603 (May) 1939.
6. Bloch, K. E., and Rittenberg, David: J. Biol. Chem. **159:** 45 (June) 1945.

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and possibly acetic acid. These observations afford another example of "the wisdom of the body" in forming an essential biologic substance from simple, plentiful chemical units. The studies also suggest the improbability that clinical anemias in man may result from an inadequate porphyrin synthesis.

HEALTH PRACTICE INDEXES

The Committee on Administrative Practice of the American Public Health Association offers the health administrator through its "Health Practice Indices" an opportunity to check his work against prevailing practices in the same area of administration.[1] Throughout its evaluation procedures the American Public Health Association has measured performance against the best existing practices rather than against theoretical ideals.

This index volume permits the health officer to check his own department in eighteen principal administrative areas. There are eighty items in the index, and for each there is a chart. Two hundred and forty-three communities in eighteen states reported their activities.

These health practice indexes have been extremely useful. Perhaps the most striking use of them is by the health department of the city of Racine, which in its 1944 report published these indexes in black with a red bar indicating the position of the city in each chart. Thus the citizens were given a complete and wholly frank evaluation of the work of public health agencies in their community.

Among the two hundred and forty-three communities in eighteen states evaluated in these indexes some of the fundamentals of public health service have not yet been developed to their full efficiency. Approved water supplies serving 100 per cent of the people are available in less than 25 per cent of communities of between 1,000 and 2,500 population; the median is 90 per cent served, but some communities run as low as 20 per cent and a few serve none. With respect to sewage disposal the record is similar but not as favorable. Rural school children are being served with water supplies of doubtful safety in a large number of communities. The median figure representing population served with satisfactory drinking water is near 75 per cent, and the lower one fourth of the communities reporting had 50 per cent or less. The same situation exists with respect to disposal of excreta. Vaccination against smallpox among children under 5 years of age indicates that the median is only 18 per cent, and below this the percentage fades rapidly to zero. Actually only two communities exceed 70 per cent, and most of the upper quartile ranges between 60 and 30 per cent of preschool children immunized against smallpox.

1. Health Practice Indices, 1943-1944, published by the American Public Health Association, price not indicated.

Current Comment

COMPLICATIONS FOLLOWING ANTIRABIC TREATMENT

Human rabies is invariably fatal. The period of incubation is from thirty to sixty days and by vaccination effective immunity can be created in a shorter time. The practice is to begin preventive vaccination as soon as possible after bite by a rabid or suspected animal. Casals [1] summarizes the results of this method of prevention during the past fifteen years. The death rate from rabies in more than 1,000,000 cases throughout the world analyzed by McKendrick [2] was 0.33 per cent. This figure does not give the exact value of antirabic vaccination of human beings because the facts as to exposures are not well enough known. In most of the cases exposure to rabies was unproved or doubtful. It is noteworthy that treatment begun as late as fourteen days after exposure appears to have given as good results as that begun earlier. The incidence of complications has been low. Reactions at sites of inoculations are of minor significance. Peripheral neuritis and dorsolumbar myelitis usually end in recovery. The most severe complications are of paralytic nature, often of ascending type. McKendrick lists 181 paralytic complications in 1,060,832 treatments, of which 48 were fatal. This kind of complication occurred more frequently with vaccine of attenuated virus (Pasteur vaccine) than with virus inactivated with phenol (Semple vaccine) or with heat. As it has not been demonstrated that any one of these vaccines is definitely superior to the others, only vaccines of inactivated virus should be used to prevent rabies in human beings, as the risk of dangerous complications will be smaller.

THE G. I. BILL OF RIGHTS

Changes in the G. I. Bill of Rights were effected by legislation passed by the Congress just before the recess. Some are of particular interest to former medical officers who have applied or who will apply for the benefits of the federal law. The requirement in the original law that a veteran over 25 years of age at the time of entry into service must show that his education was interrupted by service in order to be entitled to education benefits beyond the one year period was eliminated. The time within which a course must be initiated was extended from two to four years and the time within which education or training may be afforded from seven to nine years after the termination of the war. The subsistence allowance for a veteran without dependents was increased from $50 to $65 a month and for a veteran with dependents from $75 to $90 a month. The benefits of the titles relating to education and loans were made available to veterans on terminal leave with the exception that subsistence allowances are not payable during that period. This particular

1. Casals, J.: A Current View of the Rabies Problem, Ann. Int. Med. **23**: 74 (July) 1945.
2. McKendrick, A. G.: A Ninth Analytical Review of Reports from Pasteur Institute on the Results of Antirabies Treatment, Bull. Health Organ., League of Nations **9**: 31, 1940.

amendment was made effective as of June 22, 1944, the date of enactment of the original law. In the case of short, intensive postgraduate or training courses of less than thirty weeks, payment of the reasonable cost therefor was authorized but there will be charged against the veteran's period of eligibility the proportion of an ordinary school year which the cost bears to $500. Not in excess of $500 may be paid for any such course. As an example, if a short course of four weeks costs $250, the entire amount can be paid and the veteran will have utilized one-half a year of his period of eligibility. Heretofore the cost of such a short course has been paid on a pro rata basis. Another amendment, after continuing the limitation of $500 on the amount that may be paid to an institution on behalf of a veteran during an ordinary school year, provides that the veteran may elect to have the customary charges of the institution paid in excess of the limitation, in which event there will be charged against his period of eligibility the proportion of an ordinary school year which such excess bears to $500. This amendment permits a veteran to elect to foreshorten his period of eligibility by having paid for him the costs of an educational course in excess of the normal $500 limitation. The loan provisions of the original act were amended in numerous respects in an effort to simplify procedures, but now, as heretofore, the initial loans must be negotiated with a lending agency. Loans are not made by the Veterans Administration.

THE EMPIRICAL FORMULA OF BETA-LACTOGLOBULIN

Proteins are built up of many amino acid units characterized by their complex structures. In addition to the large number of units there exists an astronomically large possible number of arrangements of the amino acids in the straight chain peptide. The complete analysis or synthesis of a protein therefore becomes an extremely difficult task. With the advent of the microbiologic methods of analysis, new tools for the determination of amino acids are made available. These methods require smaller samples, are highly specific and are comparatively rapid. Using some of the orthodox chemical methods in conjunction with microbiologic methods, Brand and his co-workers [1] have determined the complete empirical formula of a pure protein, beta-lactoglobulin. The lactoglobulin unit consists of 370 amino acid residues, with 366 peptide linkages. In addition, it was found that the constituent amino acids are connected by the typical peptide linkage and that other methods of combination, such as ester, anhydride or imide, if present at all, could exist only in extremely small numbers. The determination of the empirical formula of a protein in this manner is an achievement; it has led closer to the solution of many of the fundamental problems in protein chemistry such as digestibility, immunologic specificity and the seat of activity in the protein hormones and enzymes.

1. Brand, E.; Saidel, L. J.; Goldwater, W. H.; Kassell, B., and Ryan, F.: J. Am. Chem. Soc. **67**: 1524 (Sept.) 1945.

THE RELATION OF INFANTILE PARALYSIS TO EPIZOOTIC AVIAN PARALYSIS

The first epidemic of infantile paralysis in Argentina was apparently in 1895. A good many outbreaks have taken place there since then. In the epidemic of 1942-1943 most cases developed in November, December and January. A recent monograph by Rillo and Lagrotta [1] presents a summary of views concerning this disease. The full account in the monograph of Preioni's observations and theories on the relations of infantile paralysis to paralytic epizootics in chickens and other birds raises the question whether a new source and a new method of natural transmission of the virus have been found. The simultaneous occurrence of paralytic disease in poultry and infantile paralysis has been recorded by several observers, but no one seems to have studied fowl paralysis in relation to the human disease so extensively and with such far reaching application as Preioni.[2] The paralytic fowl epizootic is described by him as corresponding closely to infantile paralysis in both clinical manifestations and nervous lesions; that is, the basic process is an acute anterior poliomyelitis. He assumes that in birds the infection is transmitted by the bite of a chicken louse (Dysmanisium avis) and that birds may be vehicles as well as victims of lice. The louse may be conveyed also by adhering to the surface of eggs and is of course widely distributed in poultry yards and houses. The louse is said to bite human beings, mostly on the legs. As it feeds on the blood and lymph of poultry and other birds, such as sparrows, it may by its bite transfer to human beings virus and other infectious agents from infected birds. In fact, this is the way in which infantile paralysis is spread, according to Preioni's theory. It is assumed that the virus enters through the bite of the skin and passes by perineural lymphatics to the central nervous system, the particular lesions and symptoms depending largely on the location of the bite. The immediate reaction about the bite is not described in detail but referred to as a local lymphangitis. According to the presentation in the monograph,[1] Preioni's conception is supported mainly by the similarity of the lesions in the anterior spinal horns and the spinal ganglions in the poultry paralysis studied by him and in infantile paralysis. That the poultry paralysis "always precedes and accompanies" infantile paralysis is not established by the facts at hand. So far experimental results do not appear to have been obtained bearing on the relation of fowl paralysis to infantile paralysis. Moreover inoculations of monkeys may be needed to show whether fowl epizootics are caused by the virus of infantile paralysis and also whether the incriminated louse can carry the virus.

1. Rillo, Armando B., and Lagrotta, Alfredo: Enfermedad de Heine-Medin (Parálisis Infantil), Buenos Aires, Editorial Olivé, 1944, pp. 125-146.

2. Preioni, C.: El origen de la parálisis infantil (enfermedad de Heine-Medin), Semana méd. **2**: 1149 (Nov. 13) 1941; Nuevos aportes anatómicos y clinicos al origen de la enfermedad de Heine-Medin, ibid. **1**: 1321 (June 29) 1944.

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MEDICINE AND THE WAR

ARMY

ARMY AWARDS AND COMMENDATIONS

Capt. Arthur B. Coltman

The Military Merit Medal was recently awarded to Capt. Arthur B. Coltman, formerly of Philadelphia. The citation accompanying the award mentioned with considerable detail his service to the Philippine Commonwealth and the Army of the Philippines. "During the period from Dec. 26, 1944 to Jan. 24, 1945, while serving as Philippine Civil Affairs Medical Officer, he organized dispensaries and hospitals, instituted sanitary control measures and by his painstaking and unselfish efforts rendered very valuable medical service to the civilian population of Leyte. On Jan. 29, 1945 he participated in an amphibious landing on Luzon and aided considerably in securing indispensably needed hospitals, dispensaries, medical relief supplies and food for the use of the war devastated civilians of the province of Zambales. On arriving in Manila on Feb. 23, 1945, regardless of his personal safety, he proceeded to form nineteen medical installations in various sections of the city; with the aid of civilian doctors and nurses these hospitals provided shelter, food, medical attention and life-saving surgical procedures for thousands of civilian battle casualties daily. During June and July of 1945, while he was serving with the Manila Department of Public Health, his sincere and untiring efforts were successfully directed at the problems of immunizing the civilian population of Manila against cholera, typhoid and dysentery, thereby helping considerably in averting the outbreak of an epidemic of this war torn city. From July 28, 1945 to Oct. 10, 1945 Captain Coltman, serving with the Medical Liaison Section of the United States Army Training Group, contributed immeasurably to the training of Philippine Army medical personnel." Dr. Coltman graduated from Hahnemann Medical College and Hospital, Philadelphia, in 1943 and entered the service Jan. 14, 1944.

Major General Robert H. Mills

Major Gen. Robert H. Mills, director of the dental division of the Office of the Surgeon General, was recently awarded the Distinguished Service Medal, which was presented by Major General Norman T. Kirk for "his performance of exceptionally meritorious service in a position of great responsibility." The citation recalled that "with exceptional foresight, organizing ability and leadership he provided and maintained a superior dental service, based on sound plans and professional policies, for the millions in the Army. Under his guidance the Army Dental Corps was expanded from several hundred to more than fifteen thousand officers, and dental facilities, including clinics and laboratories, were expanded proportionately. The dental rehabilitation of more than a million men accomplished under his supervision represented a tremendous contribution to the conservation of fighting manpower and to the future health of the nation. He skilfully coordinated the activities of the Dental Corps with other federal agencies and the civilian dental profession. Through his unremitting efforts to achieve exceptional standards of dental care General Mills made a notable contribution to the war effort." The award was presented at the beginning of a two day conference of service command dental surgeons which was under the direction of General Mills.

Lieutenant Colonel George F. Evans

The Legion of Merit was recently awarded to Lieut. Col. George F. Evans, formerly of Clarksburg, W. Va. Accompanying the award was a citation "for exceptionally meritorious conduct in the performance of outstanding services in North Africa and Italy from Jan. 27, 1943 to May 8, 1945. As chief of medical service in the 29th Station Hospital in North Africa and later in a similar capacity with the 32d Station Hospital in Italy, Lieutenant Colonal Evans through his superior performance of duty contributed materially to the medical service of both hospitals. Regardless of personal sacrifice, he spent many extra hours in organizing and developing his department, instructing the younger officers in the records. His tactful dealing with all ranks and his ability to work under pressure set a high example for other members of his organization. His superior professional abilities and outstanding devotion to duty reflect great credit on Lieutenant Colonel Evans and the Army Medical Service." Dr. Evans graduated from McGill University Faculty of Medicine, Montreal, in 1923 and entered the service Aug. 25, 1942.

Captain Herbert L. Songer

Capt. Herbert L. Songer, formerly of Lincoln, Kan., was recently awarded the Silver Star for gallantry in action, the Bronze Star for meritorious achievement, the Oak Leaf Cluster to the Bronze Star and the Purple Heart when he was wounded in action. The awarding of the Bronze Star was "for meritorious achievement in connection with military operations against the enemy in the European Theater of Operations from Aug. 21, 1944 to Dec. 2, 1944. The professional skill, loyalty and courage with which Captain Songer executed his responsibilities as battalion surgeon contributed immeasurably to the health of his organization's personnel and to the prompt and efficient treatment of battle casualties during the invasion of western Europe." Dr. Songer graduated from the University of Kansas School of Medicine, Kansas City, in 1938 and entered the service Nov. 1, 1942.

Colonel William W. McCaw

The Legion of Merit was recently awarded to Col. William W. McCaw, formerly of Washington, D. C., for his work as department surgeon since March 1944. The citation accompanying the award emphasized his "exceptionally meritorious conduct in the performance of outstanding services during the period March 18, 1944 to Sept. 2, 1945." Colonel McCaw, it continued, "as Alaskan department surgeon, was responsible for supervision of all elements of the medical service in this theater. Health and sanitation of the command, training of troops in military sanitation and first aid, location and operation of hospitals and other medical establishments and of the evacuation service, and supervision of training of medical troops are all functions which came directly under his supervision. By his initiative and untiring devotion to duty the efficiency in accomplishing his mission has earned commendation in all his assignments. His intelligence, industry and devotion to duty are exemplified by the high standard of medical care achieved in this department. His professional ability, judgment and understanding of the problems peculiar to Alaska and the Aleutian Islands contributed much to the health of this command and reflects great credit on himself and on the military service." Dr. McCaw graduated from the University of Pittsburgh School of Medicine in 1916 and entered the service Oct. 29, 1917.

Colonel Sydney L. Stevens

Col. Sydney L. Stevens, formerly of Indianapolis, was recently awarded the Bronze Star for meritorious achievement in connection with military operations. The official citation accompanying the award stated that "during the movement of his division he directed the treatment of the wounded and sick with outstanding efficiency." Dr. Stevens graduated from Indiana University School of Medicine, Indianapolis, in 1937 and entered the service Jan. 10, 1941.

Lieutenant Colonel Harwell Wilson

The Legion of Merit was recently awarded to Lieut. Col. Harwell Wilson, formerly of Memphis, Tenn. The citation accompanying the award read, in part, "The first sixty day period of the hospital's operations in Italy, Lieut. Col. Wilson's surgical service section treated nearly 4,000 cases, most of which were combat casualties from American and French colonial

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armies. Through unceasing and highly conscientious labor, and by virtue of his outstanding skill as a surgeon, marked devotion to duty and high qualities of leadership, surgical care of the highest order was afforded to thousands of patients, and an exceptionally low death rate was maintained." Dr. Wilson graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1932 and entered the service July 15, 1942.

Major David Borak

Major David Borak, formerly of New York, was recently awarded the Bronze Star for "outstanding medical work in the field with Chinese forces." Dr. Borak graduated from the Faculty of Medicine of the University of Vienna in 1937 and entered the service Oct. 10, 1942.

Major Albert M. Betcher

The Bronze Star was recently awarded to Major Albert M. Betcher, formerly of Long Beach, N. Y., "for meritorious service in connection with military operations, as anesthetist, 15th General Hospital, from Sept. 24, 1944 to May 8, 1945. Major Betcher efficiently set up and coordinated the operating room section of the hospital. While coordinating heavy operating schedules and supervising administering of anesthesia, he taught two week courses in anesthesia for medical officers and nurses. By his superior professional skill and devotion to duty, Major Betcher has saved the lives and hastened the recovery of many wounded." Dr. Betcher graduated from St. Louis University School of Medicine in 1935 and entered the service March 10, 1941.

VETERANS

THE NEUROPSYCHIATRIC PROGRAM

[Note.—Following is an appeal from Major General Paul R. Hawley, acting surgeon general, Veterans Administration, to physicians interested in neuropsychiatry.—Ed.]

The Neuropsychiatric Service of the Veterans Administration has positions available to doctors of varying degrees of training and experience. There are openings in general and neuropsychiatric hospitals, in outpatient clinics, in administrative positions in branch offices, and in the central office in Washington, D. C.

The Office of Postgraduate Instruction and Research is meeting success in obtaining the cooperation of medical colleges to further the teaching program in hospitals. The doctor entering the Veterans Administration can be assured that graduate training will be available, designed toward qualification for the American Board of Psychiatry and Neurology, if such is his or her desire.

Our thirty-three neuropsychiatric hospitals have acute, semiacute, chronic and semipermanently invalided patients. There are urgent psychotic patients in need of immediate treatment, those who have endured severe situational illness in the armed forces in various stages of recovery, and outpatients for follow-up study, in addition to the more chronic groups. In this rich assortment of clinical material, opportunities will be available for all types of study and treatment.

In fifty-one general hospitals an active neuropsychiatric service is being created as well. The emphasis in these units will be on active treatment of cases with good prognosis, and an attempt will be made whenever possible to complete treatment at the general hospital level. In such installations an opportunity for a concentrated experience in therapy as well as diagnosis will be afforded the members of the staff.

Another feature of general hospitals is the readjustment center for patients with neuroses. It is planned to establish such centers in hospitals as quickly as possible. Doctors working in these units will have opportunity to use all forms of therapy used in the armed services on acute neuroses, as well as some of the more prolonged technics—group therapy and brief psychotherapy in various forms.

Those physicians interested primarily in neurology, and all psychiatrists who wish to obtain experience in this field, will find opportunities to extend their studies in this direction. Plans call for an increase in our activities in neurology throughout our hospitals. As a part of this, a training program is projected in electroencephalography for both doctors and technicians in the near future.

Mental hygiene clinics will be established in thirty-one of the larger cities of the country. Positions will be available here for full time or part time clinical work. These installations will afford the clinician the satisfying experience of preventing disabling neurosis in many of his cases, plus the equal satisfaction of seeing to it that the more serious cases are hospitalized in an early stage when therapy will be of greatest benefit.

Financial remuneration for full time work in the Veterans Administration begins in Civil Service grade P & S-3 at a salary of $3,640 per annum and is graduated up to P & S-8 at a salary of $9,800 per annum. Many openings are available at P & S-4 ($4,300 per annum) and P & S-5 ($5,180 per annum). For those who wish to inquire into higher administrative positions, these will be available in grade P & S-6 ($6,230 per annum) and grade P & S-7 ($7,175 per annum). All pay schedules listed are basic and provide retirement benefits. In a bill already passed by the Congress to establish a medical department in the Veterans Administration, a 25 per cent increase is contemplated for all physician qualified by specialty boards.

Those who are interested in a career in the Neuropsychiatric Service of the Veterans Administration should make application to Dr. Daniel Blain, Acting Director, Neuropsychiatric Service, Veterans Administration, Washington 25, D. C., stating a preference as to type and location of installation preferred and enclosing a short summary of civilian and military training, experience and qualifications. Positions are available for part time consultants as well, and inquiry concerning them can be addressed in the same manner, or through Deans' Committees of affiliated medical schools.

Interested physicians are cordially invited to come to the central office in Washington, D. C., for personal interview with Dr. Blain's staff. It is preferable that this be done by appointment.

For those interested in training in neuropsychiatry per se, the Veterans Administration is planning to augment the facilities now available throughout the country. One such training center has been established and is in operation in Topeka, Kan., under the direction of Dr. Karl Menninger. Short refresher courses are available as well as a three year comprehensive training course in neurology and psychiatry, designed toward rendering its students eligible for examination by the National Board of Psychiatry and Neurology. Information concerning this school can be obtained by direct inquiry to Dr. Karl Menninger, Veterans Administration Hospital, Topeka, Kan. Opportunities for training will soon be available in several other locations.

Although much of what has been said is applicable to medicine in general in the Veterans Administration, I have addressed myself to America's neuropsychiatrists specifically because of our great need for your cooperation in our program. The physicians in this specialty in our organization are sorely overtaxed, and they need your assistance. On your willingness to lend them a hand depends the future success of their program for the returned veteran.

VETERANS' RESEARCH AIDE

Major William T. Doran, Bronxville, N. Y., was recently appointed assistant director of postgraduate instruction and research of the Veterans Administration. Major Doran recently returned from duty with the Medical Corps of India and China. He will assist Dr. Paul Magnuson in organizing postgraduate instruction in Veterans Administration hospitals.

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MEDICAL OFFICERS RELEASED BY THE NAVY

NAVAL RESERVE MEDICAL OFFICERS RECOMMENDED FOR RELEASE FROM ACTIVE DUTY

California

Arnold, Walter F.....Long Beach
Atsatt, Rodney F.....Santa Barbara
Behrendt, Robert A.....Los Angeles
Binder, Clifford F.....Alameda
Chesbro, Wayne P.....Gilroy
Childers, Leland A.....San Jose
Hodges, Francis T.....San Francisco
Hoffmann, Paul E.....San Francisco
Lounsberry, Ray C.....La Jolla
McRae, Colin C.....San Francisco
Nesburn, Henry R.....Los Angeles
Troensgaard, Clement C.....Berkeley
Wineland, Albert J.....Burbank
Wright, John M.....Pasadena
Zobel, Jerome F.....San Francisco

Georgia

Bishop, Everett L.....Atlanta
Clay, Clement C.....Atlanta
Cooper, Talbert.....Milledgeville
Gerdine, Linton.....Athens
Glenn, Wadley R.....Atlanta
Herman, Emory C.....LaGrange
Hobby, Albert W.....Atlanta
Lewis, John R., Jr.....Louisville
McCord, Ralph B.....Rome
McDonald, James J.....Athens
McGee, Harry H.....Savannah
Miller, Harry A.....Monroe
Morris, Jefferson E.....Sylvester
Philpot, William K.....Augusta
Shepard, Virgil D.....Atlanta
Thomson, James L.....Eastman
Williams, William J.....Augusta

Illinois

Andrews, Albert H. Jr.....Chicago
Baldree, Charles E., Jr.....Belleville
Barber, Knowlton E.....Evanston
Carpenter, Morgan G.....Elgin
Choisser, John E.....Eldorado
Collins, Robert B.....Rock Island
De Costa, Edwin J.....Chicago
Dolan, Martin A.....Chicago
Goldhaber, Samuel J.....Chicago
Hamilton, Howard B.....Oak Park
Hunting, Ralph D.....Chicago
Hurley, Douglas C.....Elgin
Ingram, Myron I.....Chicago
King, Edward P.....Chicago
Landberg, Harry M.....Chicago
Neber, Ernest N.....Carbondale
Nesselrod, Jerrold P.....Evanston
Nowlin, Owen W. E.....Farmer City
Peterson, Andrew C.....Chicago
Phillips, Spencer K.....Freeport
Ross, Perry W.....Chicago
Rotter, Charles C.....Alton
Sala, Roland O.....Rock Island
Steinberg, Richard M.....Fairbury
Taubert, Russell K.....Pekin
Toman, Andrew J.....Chicago
Waldman, Leonard F.....Chicago
Walker, Wayne R.....Pekin
Waner, William L.....Evanston
Wente, Constantin F.....Dundee

Indiana

Held, Albert H.....Huntingburg
Gross, Maurice E.....Lagoda
Leich, Charles F.....Evansville
Mattox, Don M.....Terre Haute
McMichael, Robert M.....Muncie
Moravec, Arthur E.....Fort Wayne
Morrical, Russel J.....Longansport
Olcott, Charles W.....Aurora
Smith, Edwin Rogers.....Indianapolis
Taylor, Frederic W.....Indianapolis
Tindall, William R.....Shelbyville

Louisiana

Brewtser, Walter R.....New Orleans
Chapman, Sims A.....New Orleans
Farrington, Nolley C.....New Orleans
Harrell, Forrest W.....Jennings
Hatchette, Charles V.....Lake Charles
Lapham, Maxwell E.....New Orleans
McCreary, Pegram L.....Coushatta
McMillan, Thomas E.....New Orleans
Miller, Morell W.....New Orleans
Moore, Robert E.....DeRidder
Oakley, John F.....New Orleans
Reed, Carson R., Jr.....Shreveport
Stern, Solomon B. Jr.....New Orleans
Stone, James K.....New Orleans
Strange, Jack E.....New Orleans
Walls, Edward G.....New Orleans
Webb, James S., Jr.....New Orleans

Maryland

Hollander, Asher.....Baltimore
Mermod, Roger J.....Annapolis

Massachusetts

Adams, Herbert D.....Wesley Hills
Allman, Charles H.....Boston
Bean, Harold C.....Salem
Belcher, Charles D., Jr.....Winthrop
Dalrymple, Sidney C.....Brookline
Devlin, William J.....Springfield
Duggan, George L.....Lowell
Garrey, Walter E.....Boston
Gleason, Ralph S.....Wellesley
Hales, Jesse C.....Gardner
Johnson, Raymond E..Newton Highlands
Kennard, Harrison E.....Newton Centre
Kilfoyle, Thomas E.....Salem
Mobbs, Robert F.....Woburn
Mullen, George T.....North Adams
Nunes, Joseph E., Jr.....Taunton
Nye, Lucius S.....Wareham
Seelye, Edwin B.....Worcester
Shedden, William M.....Boston
Shepardson, Robert B.....Reading

Michigan

Brainard, Clifford W.....Battle Creek
Brough, Glen A.....Detroit
Ellet, William C.....Benton Harbor
Haight, Harry H.....Crystal Falls
Hand, Eugene A.....Saginaw
Harris, Bradley M.....Ypsilanti
Hartzell, John B.....Groose Pt. Frams
Hill, Edward J.....Birmingham
Hoyt, Donald F.....Pontiac
Keagle, Leland R.....Battle Creek
Lemke, Walter M.....Shelby
Loeffler, Arthur J.....Detroit
Ludwixk, John E.....Jackson
McGraw, Arthur B.....Grosse Pointe
McGraw, Arthur B.....Grosse Pt.
McIntyre, Kenith S.....Hastings
O'Donnell, Dayton H.....Detroit
Roberts, Melvin D.....Hancock
Schaefer, Robert L., Jr.....Ypsilanti
Toothaker, Kenneth W.....East Lansing
Wade, Burt O.....Ann Arbor
Walcott, Carver G.....Fenton
Warner, Harold W.....Detroit
Williams, Robert J.....Monroe

Missouri

Altheide, John P.....St. Louis
Bills, Marvin L.....Kansas City
Dobbs, Otto R.....St. Louis
Freimuth, Louis E.....Clayton
Horwitz, Irwin B.....Clayton
Jarvis, James A.....Kansas City
Lee, Chester E.....Kansas City
Wood, George F.....Fulton

New Jersey

Annitto, John E.....Jersey City
Bruce, Gordon M.....Englewood
Gindhart, Floyd D.....Trenton
McKeever, William J.....Jersey City
Pieper, Howard C.....Long Branch
Rothouse, Burnet.....East Orange
Shulman, Murray W.....Newark
Tell, Meyer E.....Passaic
Worcester, John T.....Englewood

New York

Auster, Lionel S.....New York
Barnard, James H.....New York
Claiborne, Elmer M.....New York
Denneen, Edward V.....New York
Edson, George N.....Jackson Hts.
Feuer, Samuel G.....Brooklyn
Furman, Matthew R.....New York
Garlick, Thomas B.....Rochester
Gray, Julius C.....New Rochelle
Green, Leo A.....Long Island City
Hanisch, Charles M.....Brooklyn
Harbach, Francis O.....Skaneateles
Johnson, Elmer B.....Brooklyn
Jones, Quentin Adams.....Utica
Kelley, John F.....Utica
Lake, Michael.....New York
McCarthy, Eugene G.....Richmond Hill
McCarthy, Raymond J.....Buffalo
Meredith, Richard S.....New York
Perkins, Orman C.....Brooklyn
Russell, Hollis K.....White Plains
Santy, Albert C.....New York
Savarese, Lawrence A.....Brooklyn
Twinem, Francis P.....New York
Waldman, Philip H.....Jamaica

Rhode Island

Baldridge, Robert R.....Providence
Einhorn, William L.....Newport
Hanson, Frederick C.....Providence
Hubbard, John D.....Edgewood
Hughes, William N.....Providence
Marquis, Gordon.....Pawtucket
Rhumann, Edward F.....Cranston
Robinson, Nathaniel D.....Pawtucket
Schwab, William J.....Providence
Williams, Robert J.....Apponang

South Carolina

Belk, James C.....Kershaw
Bennett, Thomas W.....Columbia
Bowen, Harold J., Jr.....Charleston
Cranz, Oscar W.....Kingston
Smith, Keitt Hane.....Greenville

South Dakota

Billion, Thomas J., Jr.....Sioux Falls
Ferris, William T.....Chamberlin
Garrett, Edwin E.....Doland
Gelber, Maksymiljan R.....Aberdeen
Soe, Carl A.....Lead
Underdahl, Laurentius O.....Centerville
Williams, Delbert B.....Mitchell

Utah

Daynes, Byron W.....Salt Lake City
Galligan, John J.....Salt Lake City
Holley, Edward B.....Salt Lake City
Pendleton, Ralph C.....Salt Lake City
Sundwall, Olof.....Murray

Vermont

Lockwood, Jay R.....West Rutland
Ross, Stewart.....Rutland
Shaw, Christopher C.....Bellow Falls

Puerto Rico

Slagle, Thomas D.....Santurce
Wall, Garton E.....Ewa, Oahu

ORGANIZATION SECTION

Medical Legislation

DEPARTMENT OF MEDICINE AND SURGERY IN THE VETERANS ADMINISTRATION

An Analysis of H. R. 4717 Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association

Congressional action has been completed on H. R. 4717, a bill to create in the Veterans Administration a Department of Medicine and Surgery. While he disclaimed perfection for the legislation and frankly recognized that it contained objectionable provisions, the Acting Surgeon General of the Veterans Administration, Major Gen. Paul R. Hawley, urged that Senate action on the bill be not delayed in an effort to remove those provisions. He stated before the Senate Committee on Finance that unless action on the bill was completed before the Christmas recess the medical service of the Veterans Administration would "suffer further grave consequences which may well be irreparable. In the interest of the thousands of disabled veterans who have, by their sacrifices, earned better medical care than they are now receiving, I urge immediate action upon this bill." Responding to this plea, the Senate passed the bill without amendment.

In the opinion of the Senate Committee on Finance, legislation to make available a better quality of medical care for veterans should (1) incorporate adequate provisions as to organization and authority without military aspects; (2) provide by statute certain positions with adequate salary stipulations, with specified salary ranges for physicians, nurses and dentists, and a special salary range for attendants; (3) authorize appointments to certain specified positions without regard to civil service, by the Administrator of Veterans' Affairs; (4) provide a civil service system of retirement in preference to a military system; (5) retain classified civil service for positions not specifically exempted therefrom by the legislation; (6) incorporate authority to dispense with the services of unsatisfactory or disqualified employees in certain categories without the restrictions of the laws and regulations pertaining to civil service, and (7) incorporate such special provisions as are necessary to insure an adequate and complete medical and hospital service in the Veterans Administration. H. R. 4717, as viewed by the committee, will meet these objectives.

THE DEPARTMENT OF MEDICINE AND SURGERY

The new department will include an Office of the Chief Medical Director, Medical Service, Dental Service, Nursing Service and Auxiliary Service. The Chief and Deputy Medical Directors must be qualified doctors of medicine and will be paid a salary of $12,000 and $11,500 a year, respectively. Provision is made for the appointment of eight Assistant Medical Directors, one of whom will be a qualified doctor of dental surgery and will be directly responsible to the Chief Medical Director for the operation of the Dental Service. Each such Assistant Medical Director will be paid a salary of $11,000 a year. There will be a Director and Deputy Director of Nursing Service at a salary of $8,000 and $7,000 a year respectively. A Chief Pharmacist, Chief Dietitian, Chief Physical Therapist and a Chief Occupational Therapist will each be paid a salary of $6,000 a year. All of these appointments will be made by the Administrator of Veterans' Affairs for a four year period, and reappointments may be made for successive like periods. The administrator may remove an appointee for cause.

Section 4 authorizes the employment of additional personnel, including doctors, dentists, nurses, managers of hospitals, homes and centers, pharmacists, physical therapists, occupational therapists, dietitians, pathologists, bacteriologists, chemists, biostatisticians and other medical and dental technologists.

QUALIFICATIONS FOR APPOINTMENT

A person to be eligible for appointment to the Department of Medicine and Surgery must be a citizen of the United States. For appointment in the Medical Service, the appointee must hold the degree of doctor of medicine or of doctor of osteopathy from a college or university approved by the Administrator, have completed an internship satisfactory to the Administrator and be licensed to practice medicine, surgery or osteopathy in one of the states or territories of the United States or in the District of Columbia. Similar qualifications are included to apply to appointments in the Dental Service, in the Nursing Service and in the Auxiliary Service. Persons on terminal leave from the armed forces may be appointed and may be paid for their services rendered under such appointment notwithstanding any law or regulation to the contrary.

Appointments of physicians, dentists and nurses will be made only after qualifications have been satisfactorily established in accordance with regulations prescribed by the Administrator and without regard to civil service requirements. Appointments authorized by section 4 will be for a probationary period of three years. The record of each person serving under an appointment in the Medical, Dental and Nursing services will be reviewed from time to time by a board appointed in accordance with regulations by the Administrator. If the board finds any appointee not fully qualified and satisfactory, he will be separated from the service. Physicians, dentists and nurses serving in the present Medical Service will be continued in their present positions until the Administrator shall have determined their qualifications.

PROMOTIONS

Promotions of physicians, dentists and nurses will be made only after examination given in accordance with regulations prescribed by the Administrator. Automatic promotions within grade may be made in increments of the minimum pay of the grade in accordance with the regulations.

PRESERVATION OF CIVIL SERVICE STATUS

The new law provides for the protection of civil service reinstatement rights in cases of those who at the time of appointment have a civil service status and whose employment in the department is not continued.

GRADES AND PAY RANGES

In the Medical Service there will be six grades beginning with the junior grade with a minimum salary of $3,640 and advancing to the chief grade, with a maximum salary of $9,800. In the Dental Service there will be five grades, ranging from the junior grade with a minimum salary of $3,640 to the senior grade with a maximum salary of $8,225. In the Nursing Service there will be four grades, ranging from junior grade with a minimum salary of $2,320 to senior grade with a maximum of $5,180. There is provision, in addition, for an Assistant Director of the Nursing Service with a salary range from $5,180 to $6,020.

The Administrator will be authorized to prescribe by regulation the hours and conditions of employment and leaves of absence of physicians, dentists and nurses.

RATING AS SPECIALISTS

The Chief Medical Director will be authorized to rate any physician appointed under section 4 as a medical or surgical specialist. No such rating may normally be given unless the physician is certified as a specialist by an American specialty board. In event that no such board exists, the rating may be given if the physician has been examined and found qualified by a board appointed by the Chief Medical Director from specialists of the Department of Medicine and Surgery holding ratings in the specialty to which the candidate aspires. In case there are insufficient specialists to constitute such a board, the Chief Medical Director may substitute consultants with comparable qualifications employed on a temporary full time, part time or fee basis.

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Physicians to whom such specialist rating is given will hold it until it is withdrawn by the Chief Medical Director after a determination has been reached by a board of specialists that the physician is no longer qualified in this specialty.

Physicians who are given the rating of specialists will be entitled, in addition to their basic pay, to an allowance equal to 25 per cent of such pay, subject to the restriction that the basic pay plus the allowance may not exceed $11,000 a year.

CIVIL SERVICE RETIREMENT BENEFITS

Persons appointed to the Department of Medicine and Surgery will be subject to the provisions of and entitled to benefits under the Civil Service Retirement Act of May 22, 1920.

DISCIPLINARY BOARDS

The Chief Medical Director will be authorized to appoint disciplinary boards to determine, on notice and fair hearing, charges of inaptitude, inefficiency or misconduct. Each board will consist of not less than three nor more than five employees, senior in grade, of the Department of Medicine and Surgery. The Administrator will appoint a chairman and secretary of each board, who will have authority to administer oaths. The Chief Medical Director may appoint one or more investigators to assist in the collection and presentation of evidence, and every person against whom charges are made may be represented at the hearing by counsel of his own choice. A disciplinary board may recommend reprimand, suspension without pay, reduction in grade, and discharge from the Department of Medicine and Surgery. The Administrator will be required either to approve the recommendation as made, approve it with modification or exception, approve it and suspend further action at the time, or disapprove such recommendation; and the decision of the Administrator will be final.

APPOINTMENT OF ADDITIONAL EMPLOYEES

The Administrator will be authorized to appoint, under civil service laws, rules and regulations, such additional employees as may be necessary. Employees of the Medical Service as at present constituted, other than those previously mentioned, will receive original appointments to the department in their present civil service status on certification of satisfactory service by the manager of the hospital, home or center where such person is at present employed. The annual salary range for hospital attendants will be $1,572 minimum to $1,902 maximum.

SPECIAL MEDICAL ADVISORY GROUP

The Administrator will be required to establish a special medical advisory group composed of members of the medical and allied scientific professions, nominated by the Chief Medical Director. The duties of this group will be to advise the Administrator, through the Chief Medical Director, and the Chief Medical Director direct, relative to the care and treatment of disabled veterans and relative to other matters pertinent to the Department of Medicine and Surgery. The group will conduct regular calendar quarterly meetings, and the number, terms of service, compensation and allowances to members of the group will be in accord with existing laws and regulations.

ATTENDANCE AT MEETINGS

The Chief Medical Director will be authorized to detail designated personnel to attend meetings of associations for the promotion of medical and related sciences and to pay their expenses. Among others, the Deputy Medical Director, the eight Assistant Medical Directors and the physicians, dentists and nurses appointed under the authority contained in section 4 may be so designated.

POSTGRADUATE INSTRUCTION

The Administrator will also be authorized to afford educational opportunities to the personnel referred to in the preceding paragraph by detailing them to schools of the Army, Navy and Public Health Service and to civil institutions of learning for the purpose of increasing the professional knowledge or technical training of the personnel of the department. Such details may not be for a period in excess of ninety days in a year, will be subject to the consent of the authorities of the institutions and may not exceed 5 per cent of the personnel of the department at any one time. Tuition, transportation and educational fees of personnel so detailed will be paid. If any person authorized to attend any such course of training voluntarily leaves the service within two years after the completion of the course, he will be required to reimburse the Veterans Administration for the expenses incurred.

EMPLOYMENT ON PART TIME BASIS

On the recommendation of the Chief Medical Director, the Administrator may employ, without regard to the Classification Act of 1923, physicians, dentists and nurses on a temporary full time, part time or fee basis. Dietitians, social workers, librarians and other professional, clerical, technical and unskilled personnel may be employed on a temporary full time or part time basis at such rates of pay as the Administrator may prescribe. No temporary full time appointment may be made for a period in excess of ninety days.

RESIDENCIES

The Administrator will be authorized to establish residencies, to appoint qualified persons to such positions without regard to civil service or classification laws, rules or regulations and may prescribe the conditions of such employment, including necessary training, and the customary amount and terms of pay during the period of such employment and training.

RULES AND REGULATIONS

The Chief Medical Director with the approval of the Administrator, unless specifically otherwise provided, will be authorized to promulgate all regulations necessary to the administration of the Department of Medicine and Surgery and consistent with existing law. Such regulations will include those relating to travel, transportation of household goods and effects, and deductions from pay for quarters and subsistence and to the custody, use and preservation of records, papers and property of the Department of Medicine and Surgery.

EFFECTIVE DATE OF LAW

This law becomes effective from the date of its approval by the President.

MEDICAL BILLS IN CONGRESS

G. I. Bill of Rights

A conference report on H. R. 3749, a bill to amend the G. I. Bill of Rights, has been accepted by the House and Senate. As will appear elsewhere in this issue, this bill increases the subsistence allowance available to veterans who pursue educational or training courses, will make certain benefits available to officers while on terminal leave, will eliminate the 25 year age limitation on presumption of interruption of education, will increase the amount that may be paid by the Veterans Administration in connection with short courses pursued by veterans, will permit a veteran to elect to foreshorten his period of eligibility by having tuition charges in excess of $500 paid and amends in numerous respects the loan provisions of the existing law.

National Science Foundation Act of 1945

Senator Kilgore, West Virginia, for himself and Senator Johnson, Colorado, Senator Pepper, Florida, Senator Fulbright, Arkansas, and Senator Saltonstall, Massachusetts, has introduced, as S. 1720, a revised bill to promote the progress of science and the useful arts, to secure the national defense and to advance the national health and welfare. It proposes to establish an independent agency in the federal government to be known as the National Science Foundation which will be administered by an administrator appointed by the President by and with the advice and consent of the Senate. The administrator will be required to consult and advise with a National Science Board the members of which will be appointed by the President, by and with the advice and consent of the Senate.

Hospital Construction

H. R. 5014, introduced by Representative Lyndon B. Johnson, Texas, proposes to enact the Federal Hospital Aid Act. It was referred to the House Committee on Banking and Currency

and would authorize the Reconstruction Finance Corporation to make loans and grants in amounts not exceeding the total of $500,000,000 to municipalities and nonprofit organizations for the planning, construction, improvement and extension of hospitals and public health centers.

Veterans Administration

The bill providing for the creation of a Department of Medicine and Surgery in the Veterans Administration, H. R. 4717, has passed the Senate without amendment. It therefore retains the provision authorizing the utilization of the services of osteopaths in the treatment of veterans.

H. R. 5041, introduced by Representative Weaver, North Carolina, would authorize the Administrator of Veterans' Affairs to furnish domiciliary care and medical and hospital treatment to individuals who have served without compensation for ninety or more days as members of a selective service system civilian local board.

A bill introduced by Representative Doyle, California, H. R. 5012, proposes to dispense with the requirement that a veteran be unable to pay hospital expenses, in non-service connected cases, as a condition to hospitalization and domiciliary care in Veterans Administration facilities.

The construction of a veterans' hospital in Humboldt County, Calif., is proposed by H. R. 4739, introduced by Representative Lea, California.

Miscellaneous

A bill introduced by Representative Elston, Ohio, H. R. 4706, would authorize the appointment of members of the Navy Nurse Corps as commissioned officers of the Naval Reserve.

Washington Letter

(From a Special Correspondent)

December 23, 1945.

Hearings Are Still Awaited on Truman "Health" Program

Congress has taken a twenty-three day vacation during the Christmas and New Year's holidays but faces stormy weather in the second session of the 79th Congress, which starts January 14. President Truman's compulsory health insurance program is one of a number of measures sponsored by the chief executive which are expected to meet with considerable opposition when they come up for passage. The President has also asked for permanent status for the Fair Employment Practices Committees, authorization of labor fact-finding boards, a full employment act, compulsory military training, a higher statutory minimum wage, unification of the Army, Navy and Air Forces, legislation for domestic control of atomic energy, pay raises and pensions for members of Congress and an act to make the speaker of the House next in succession to the Vice President in line of succession to the White House, instead of the Secretary of State. Mr. Truman has also appealed for rapid admission of refugees from Europe to the United States within quota limits, particularly orphaned children.

New Influenza Vaccine Going to Civilians Next Year

The War Department and the United States Public Health Service reveal that licenses have been granted to manufacturers to make the new anti-influenza vaccine for distribution to the general public. The vaccine, developed by the Army and by pharmaceutical firms during the war, will be available next year to civilians. Definite dates could not be named because of the complexity of the problems of laboratory capacity, manufacture and distribution. More than 5,000,000 doses of the vaccine were administered to soldiers in this country during the 1943-1944 epidemic, with promising results. Supplies were shipped overseas last October to army posts abroad and to military establishments in this country to vaccinate soldiers against influenza in the greatest mass test of a medicine in history. The inoculations are said to protect the average person for three to four months.

Medical Survey Boards Subject to Review Under New G. I. Bill

One feature of the revised G. I. Bill of Rights as recently approved is that Army and Navy review boards are authorized to review findings not only of retiring boards but also of medical survey and disposition boards. Some officers have claimed they were wrongly deprived of disability retirement rights. Under the revised bill thousands of veterans may take advantage of the government's offer of loan guaranties and free education. Dr. Francis J. Brown of the American Council on Education states that by next fall colleges will be swamped with applications for ex-G. I.s who can afford to attend school under the higher living allowance. This is expected to have an appreciable effec on the number of medical students starting or resuming medical studies.

Rat Population Checked for Typhus

The increasing number of rats infesting Washington has resulted in a survey of the District of Columbia rat population for typhus infection, if personnel can be obtained from the U. S. Public Health Service, Dr. D. L. Seckinger, deputy health officer for the District, stated. Already three rats captured in one downtown area have been found to be infected. A 12 year old girl was infected with typhus recently but recovered, after being bitten by a rat in the K Street area.

Because of shortages of nurses, doctors and facilities, 160 Washingtonians with far advanced cases of tuberculosis are not hospitalized, reports Edward K. Funkhauser, of the District of Columbia Tuberculosis Association. He advocated higher salaries for tuberculosis hospital personnel, declaring that pay in the Capital is less than in Maryland or Virginia.

Veterans Administration Seeks More Army Hospitals

Major Gen. Paul R. Hawley, acting Surgeon General of the Veterans Administration, reveals that the agency will be able to use more of the armed forces surplus hospitals. Of sixty declared surplus by the Army and Navy, General Hawley and Veterans Administrator Omar Bradley have accepted only eight. The others were deemed of temporary construction or located too far from medical centers. Hawley reports that the shortage of hospital beds is becoming increasingly serious, resulting more from a lack of personnel rather than a shortage of hospital facilities.

General Bradley has informed a Negro delegation that he will make an effort to end segregation of Negroes by the Veterans Administration. Previously he had told Negroes that the agency must follow local custom.

Discharge Scores Reduced for Army and Navy Doctors

Both the Army and the Navy have cut the discharge scores for medical personnel. Male navy doctors who need 53 points now will be cut to 51 points on January 1 and to 50 on February 2. Navy nurses drop from 32 points to 29 Jan. 1. There was a 5 point cut to 65 for Dental and Veterinary Corps officers and for all Medical Corps officers except specialists. The discharge age will be reduced by three years to 45 for all Medical and Dental Gorps officers except plastic surgeons. Discharge provisions for Sanitary Corps and Medical Administration Corps officers, army nurses, physical therapists and dietitians remain unchanged.

Blind Instructors Will Teach Blind War Veterans

The Veterans Administration announces that blind instructors will teach blind veterans in nine special instruction centers under a new policy of its occupational therapy department. The agency's problem with sightless veterans almost entirely concerns veterans of the first world war, of which there are 320 in Veterans Administration hospitals and 185 in its homes. Veterans' hospitals are also making increasing use of sports such as golf and has nineteen golf courses in operation, with six more being installed. It is planned to install nine-hole courses in many of its neuropsychiatric and general medical hospitals.

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Committee Recommends Establishment of Mental Health Institute

The House Interstate and Foreign Commerce Committee has recommended the establishment of a $4,500,000 mental health institute at Bethesda, Md., to combat the nation's mental health problem. Informed that more than half the country's hospital beds were occupied by neurotic patients, the committee unanimously supported the bill authorizing the U. S. Public Health Service to spend $10 million a year to combat mental diseases. Representative J. Percy Priest, Democrat of Tennessee, sponsor of the bill, declared that the committee action paved the way for a coordinated program.

Federal Alcohol Clinics Advocated

Federal operation of clinics for alcoholic addicts similar to services provided for narcotic users was advocated by William H. Escaville Jr., president of the Atlas Publishing Company and a leader in Alcoholics Anonymous. Addressing a Rotary Club audience, he appealed for more constructive government and civil action to cope with alcoholism, which he said is a liability to community and family life.

Million Overseas War Veterans Return Monthly

The Senate Mead Investigating Committee was informed by Army and Navy officials that veterans are being returned from overseas at the rate of a million monthly. They also stated there were plenty of ships to bring the troops home. A million men were returned in November and as many more are expected to be brought home this month.

Committee on Scientific Exhibit

THE SAN FRANCISCO SESSION

Section Representatives to the Scientific Exhibit

The various sections of the Scientific Assembly have appointed the following representatives to the Scientific Exhibit to assist and advise in the procurement of exhibits for the San Francisco session, July 1 to 5:

Practice of Medicine
Dr. Thomas C. Garrett, 3803 Oak Road, Germantown, Philadelphia.
Surgery, General and Abdominal
Dr. Warren H. Cole, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.
Obstetrics and Gynecology
Dr. Frederick H. Falls, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.
Ophthalmology
Dr. Georgiana D. Theobald, 120 Medical Arts Building, Oak Park, Ill.
Laryngology, Otology and Rhinology
Dr. Paul H. Holinger, 700 North Michigan Avenue, Chicago 11.
Pediatrics
Dr. W. Ambrose McGee, 1601 Monument Avenue, Richmond, Va.
Experimental Medicine and Therapeutics
Dr. Robert W. Wilkins, Evans Memorial Hospital, 65 East Newton Street, Boston.
Pathology and Physiology
Dr. Frank W. Konzelmann, Atlantic City Hospital, Atlantic City, N. J.
Nervous and Mental Diseases
Dr. F. P. Moersch, Mayo Clinic, Rochester, Minn.
Dermatology and Syphilology
Dr. Hamilton Montgomery, 102 Second Avenue S.W., Rochester, Minn.
Preventive and Industrial Medicine and Public Health
Dr. Paul A. Davis, 1436 Delia Avenue, Akron 2, Ohio.
Urology
Dr. John H. Morrissey, 40 East Sixty-First Street, New York.
Orthopedic Surgery
Dr. David M. Bosworth, 742 Park Avenue, New York 21.
Gastro-Enterology and Proctology
Dr. Grant H. Laing, 104 South Michigan Avenue, Chicago.
Radiology
Dr. S. W. Donaldson, 326 North Ingalls Street, Ann Arbor, Mich.
Anesthesiology
Dr. Urban H. Eversole, 605 Commonwealth Avenue, Boston.
General Practice
Dr. Wingate M. Johnson, 402 North Liberty Street, Winston-Salem, N. C.

Application blanks for space in the Scientific Exhibit may be obtained from the Section Representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE NEWS

Prepayment Plans Grow

Delaware: A recent news release by the New Castle Medical Society (Delaware) points out that "one fourth of the people in Delaware are enrolled in the state society's voluntary prepayment medical care plan." A small state, sure, but still an excellent record.

Florida: A prepayment medical service plan will soon be ready to operate in Florida. The preliminary work has been done. The application for a charter gives the name as the Florida Medical Service Corporation. Dr. Leigh F. Robinson of Fort Lauderdale is chairman of the special committee.

Indiana: Indiana approached a step nearer in the development of a prepayment plan at its November 8 house of delegates meeting. The prepayment plan committee was instructed to draft final plans for an indemnity plan and have them ready in December for a special meeting of the state council.

Kansas: Dr. Barrett A. Nelson of Manhattan, president of the Kansas Physicians' Service, has announced that the plan is about ready to start operation. All details have been worked out, and final approval of the state insurance commission is expected soon.

Albany, N. Y.: At present all of New York State is served by prepayment plans except the Albany area. At the Oct. 31, 1945 meeting of the Comitia Minora of the Albany County Medical Society a special committee headed by Dr. J. E. Heslin presented a plan to serve this area. The proposal suggested a combination cash indemnity-service plan to be set up and financed by the eleven counties to be served. Operations would be conducted in cooperation with the Blue Cross plan. Suggested income limits for the service plan were given as $2,000 for the individual, $2,500 for husband and wife and $3,500 for the family. It was further suggested that acceptable monthly rates might be 75 to 80 cents for the subscriber, $1.50 for the subscriber and one dependent and $2 for the family. The plan was approved in principle and referred back to the committee to complete the details of organization.

Community Health Councils

The Community Health Council idea as a medium for public relations and to assist in activating health programs seems to have a promising future. Until recently health councils have generally been local medical society projects. Dr. John Fitzgibbon has emphasized the importance of such councils in the statement that most public health problems could be satisfactorily solved at the local level if local medical societies would assume the leadership in a plan of cooperative effort with other interested local organizations and agencies with whose leaders friendly relations were easily made or already existent.

Another program just instituted, which presents a different and interesting approach to the problem, is that of the Michigan Health Council. This is not an effort solely by the doctors of Michigan but represents the combination and coordination of their influence and support with that of other organizations of the state which have a common interest. The council was incorporated a year ago as a joint organization of the Michigan State Medical Society, the Michigan Hospital Association, Michigan Medical Service and Michigan Hospital Service.

Public Relations

The Louisiana State Medical Society has developed a working system for getting the facts on various health bills to the doctors. The society's congressional committee and other special committees gather the facts and opinions of Congressmen. This is disseminated to the membership through editorials and articles in the *New Orleans Medical and Surgical Journal* along with special detailed reports. An advertising committee arranges for newspaper space throughout the state to get facts to the public, and the medical societies arrange for editorial comment.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

DISTRICT OF COLUMBIA

Personal. — A hospital now being constructed in Ciudad Trujillo, Dominican Republic, will be named in honor of Dr. William A. Morgan, Washington, in recognition of his services while in that country early this year.

The Davidson Lecture.—Dr. Joseph T. Roberts, adjunct clinical professor of medicine at Georgetown University School of Medicine, Washington, was chosen the Davidson Lecturer of the Medical Society of the District of Columbia in 1945. In the competition to select the lecturer Dr. Roberts submitted a paper on "The Role of the Small Vessels and Nerves of the Heart in Heart Failure and Cardiac Pains."

Faculty Changes at Georgetown.—Dr. Henry R. Schreiber, clinical professor of medicine at Georgetown University School of Medicine, was recently promoted to professor and acting director of the department of medicine, filling the vacancy that occurred with the resignation of Dr. Wallace M. Yater (THE JOURNAL, December 1, p. 970). Dr. William F. O'Donnell was promoted to professor and acting director of the department of pediatrics to succeed Dr. Joseph S. Wall, who resigned after serving as a member of the faculty for forty-seven years. Dr. Charles A. Millwater was named associate professor of clinical pediatrics to succeed Dr. John H. McLeod, resigned.

GEORGIA

Personal.—Dr. Cornelius F. Holton, Savannah, has been appointed chief surgeon of the Central of Georgia Railway, effective September 1, succeeding Dr. Craig Barrow, who died August 31.——Dr. Arthur D. Knott, Leesburg, has been made health officer of Mitchell County with headquarters in Camilla.

Richard Wood Fills New Position.—Dr. Richard Hugh Wood has been appointed associate professor of medicine at Emory University Medical School and physician-in-chief at Emory University Hospital. The position of physician-in-chief is a newly created one and Dr. Wood is the first appointee. Dr. Wood was an associate in medicine prior to entering military service.

Department of Physical Medicine Created. — Emory University on December 21 announced the establishment of a department of physical medicine at its hospital and the start of a five year program in the specialty for Atlanta and the Southeast under a grant of $167,000 from the National Foundation for Infantile Paralysis. The department will be operated by Emory University School of Medicine under the direction of Dr. Robert L. Bennett, director of physical medicine at Georgia Warm Springs Foundation and newly appointed professor of physical medicine on the medical school faculty. Dr. Bennett will divide his time between Warm Springs and Atlanta. Plans also call for appointment of an assistant director in charge of research and a staff to include a resident, two technicians and a secretary. After the first year the staff will be gradually enlarged to reach a total of seven specialists and two secretaries by the end of the five year period. The staff "will investigate various phases of physical therapy and cooperate with other departments in the university medical school in the application of physical medicine to the treatment of patients." The program will provide for extensive research in the field of physical medicine as applied to neuromuscular diseases, particularly poliomyelitis; a schedule of training for doctors in physical medicine and for technicians in physical therapy, and establishment of facilities for the treatment of victims of infantile paralysis and other diseases by physical therapy.

ILLINOIS

Chicago

The Bacon Lectures.—Carl R. Moore, Ph.D., professor and chairman of the department of zoology, University of Chicago, will deliver the Charles Sumner Lectures for 1945-1946 at the University of Illinois College of Medicine January 16-17 on "Studies in the Biology of Sex." Individual titles of the lectures will be "The Role of Sex Hormone in the Differentiation of the Reproductive System" and "Some Aspects of Development in the Uterus, and in Ovaries Subjected to Experimental Treatment."

Meeting of Institute of Medicine.—At the annual meeting of the board of governors of the Institute of Medicine of Chicago, December 12, the following officers were elected for the coming year: Drs. William F. Petersen, chairman of the board of governors; Ernest E. Irons, president; Percival Bailey, vice president; George H. Coleman, secretary; Grant H. Laing, treasurer. Dr. Italo F. Volini was elected a member of the board of governors for a term of five years. At the thirtieth annual meeting of the institute on December 4, in the Grand Ball Room of the Palmer House, Mrs. Harry Hart, long actively engaged in health and child welfare services in Chicago, Miss Mary E. Murphy, the director of the Elizabeth McCormick Memorial Fund, and Mr. Wilfred S. Reynolds, director of the Council of Social Agencies of Chicago, were received into citizen fellowship. Citizen fellowship is conferred by unanimous vote of the board of governors on persons who are interested in and who have materially contributed to the welfare of the community in the field of medicine, dentistry, nursing, public health, social service or instruction, and not more than three candidates can be elected in any one year.

KENTUCKY

Personal. — Layton B. Hardman, D.Sc., LaGrange, has resigned as superintendent of the Mallory Taylor Memorial Hospital.——Dr. Joseph P. Holt, assistant professor in the department of physiology, University of Louisville School of Medicine, has been appointed director of medical research, Standard Oil Company of New Jersey, with offices in New York.——Dr. George M. McClure Jr. has been appointed a member of the Danville Board of Education.

Physician Honored for Public Service.—Dr. Owen M. Carroll, New Castle, was recently presented with the medal for meritorious professional and public service sponsored and donated by Dr. E. Murphy Howard, Harlan, past president of the Kentucky State Medical Association, in recognition of his many services to organized medicine and to his people for more than a half century. Dr. Carroll has served for thirty-seven years as secretary of the Henry County Medical Society and for thirty-eight years as health officer of the county.

Changes in Health Officers. — Dr. George M. Wells, Bowling Green, has returned to the directorship of the Warren and Simpson County health departments, succeeding Dr. Paul Q. Peterson, who has been granted a scholarship in public health at the University of Michigan. Dr. Raymond E. Wehr, Newport, has been named health officer of Campbell County. He has been acting health officer since last September, when he filled the vacancy that occurred with the death of Dr. Clayton W. Shaw, Alexandria. Dr. Frank K. Sewell has been named health officer for the Knox, Whitley and Laurel county health district, succeeding Dr. Richard B. Fulks, Barbourville, who has been granted a fellowship to pursue a course in public health. Dr. Charles D. Cawood, Lexington, has resigned as health officer of the Lexington-Fayette County Health Department. Dr. Wilber V. Bradshaw Jr., Stanford, is the new health officer of Shelby County, succeeding Dr. Bertha A. C. Wiseman.

MASSACHUSETTS

Obstetrical Meeting.—On December 12 the New England Obstetrical and Gynecological Society held its seventeenth annual meeting at the Harvard Club, Boston. In addition to clinics held at the Free Hospital for Women, Carney Hospital and the Boston City Hospital the program included:

Dr. Louis K. Diamond, Boston, The Recent Practical Advances in the Understanding of the Rh Factor.
Dr. Arthur T. Hertig, Boston, Hydatidiform Mole: Some Recent Pathologic and Clinical Observations on Two Hundred Cases.
Dr. Edward G. Waters, Jersey City, N. J., A Discussion of Disputed Indications and Technics for Cesarean Section.

MICHIGAN

Physician Members of Rehabilitation Advisory Committee.—According to a recent announcement, the four physician members of the sixteen member state advisory committee for vocational rehabilitation include:

Dr. Charles L. Hess, Bay City, reappointed, representing Michigan State Medical Society
Dr. Raymond Hussey, Detroit, representing Wayne University.
Dr. William DeKleine, Lansing, representing the state health department.
Dr. Carleton Dean, Lansing, representing the Michigan Crippled Children Commission.

Grant for Research.—The Smith, Kline and French Laboratories have made a grant of $2,500 a year for two years to Dr. Amedeo S. Marrazzi, professor and head of the department of pharmacology and therapeutics of Wayne University

College of Medicine, Detroit. The grant is for the further study, by electrical methods, of drugs acting on the autonomic and central nervous systems.

MINNESOTA

Gift for History in Public Health. — The Minnesota Historical Society has announced the receipt of a gift of $25,000 from the Mayo Properties Association, Rochester, for the writing and publication of a history of public health in Minnesota.

Grant for Medical Fellowships.—A gift of $25,000 was made to the University of Minnesota Medical School, Minneapolis, by the Ebin Foundation of Minneapolis to support five graduate medical fellowships of $1,000 a year each, to be awarded immediately to veterans of World War II.

The Bell Lecture.—Dr. Haven Emerson, New York, acting director of the Minnesota School of Public Health, Minneapolis, gave the twelfth annual Bell Lecture before the Hennepin County Medical Society, December 3. His subject was "What Public Health Expects of the Private Physician."

Carl Potthoff Joins Red Cross.—Dr. Carl J. Potthoff, associate professor of preventive medicine and public health, division of personal health and health education, University of Minnesota Medical School, Minneapolis, has resigned to become assistant medical director of the American Red Cross with headquarters in Washington, D. C., according to the *Bulletin of the Hennepin County Medical Society.*

Personal.—Dr. Lewis S. Jordan, Granite Falls, was elected president of the Minnesota Public Health Association recently to succeed Dr. Francis E. Harrington, Minneapolis.——Dr. Jay Arthur Myers, professor of preventive medicine and public health, division of public health administration and epidemiology, University of Minnesota Medical School, Minneapolis, has been elected editor-in-chief of the *Journal of the American College of Chest Physicians.*

Electron Microscope.—An electron microscope has recently been installed in Millard Hall at the University of Minnesota Medical School, Minneapolis. The following are among the investigations which will involve the use of the microscope: the intracellular identification of a virus-like agent responsible for the high percentage of mammary carcinoma in susceptible strains of mice, microscopic examination of bone, dentin and enamel, a study of the nature of virus inclusions in certain diseases such as vaccinia and herpes, and studies of the finer detail of bacteria with diameters of the order of 0.5 micron.

Proposed Heart Hospital. — The Variety Club of the Northwest has offered to sponsor the construction of a hospital on the medical campus of the University of Minnesota Medical School, Minneapolis, to be known as the Variety Heart Club of the Northwest. A movement has already started to provide for a $325,000 structure on the medical campus. Sponsored by the Variety Club of the Northwest, it will be financed by all northwestern residents who are interested in the advancement of public health. The Variety Club will pledge a minimum of $25,000 a year to the institution for the care of children from counties that do not have funds available for such care. The unit will comprise a hundred beds. A hundred bed hospital, completely equipped with the most modern of accommodations and equipment to treat patients with rheumatic disease, will also be a clinic available for doctors throughout the Northwest to study this disease. It will also be an outpatient clinic in which ambulatory patients from the entire Northwest can be examined and obtain diagnosis. The research facilities at the University of Minnesota will provide cooperation of all phases of medical science. In this heart hospital it will be possible to study not only rheumatic fever in children but also all phases of heart disease in adults.

NEW YORK

Graduate Lectures.—Dr. David J. Impastato, New York, will discuss "The Value of Shock Therapy in Psychiatry" before the Nassau County Medical Society in Rockville Center, January 29. Dr. John G. F. Hiss, Syracuse, will discuss "Rheumatic Fever—Rheumatic Heart Disease" before the Ontario County Medical Society January 8 in Canandaigua. The first lecture is sponsored by the state medical society and the second by the society in cooperation with the state department of health.

Human Death from Rabies.—On October 17 a 2½ year old girl died in Buffalo from rabies. She had received medical treatment within one hour of the time she had been bitten on September 22 while playing in the yard of her home in Concord. A moderately deep laceration on the right side of the nose medial to the lower eyelid was cauterized with fuming nitric acid and the wound closed with a single suture, according to *Health News.* A superficial "scratch" beneath this injury and wounds of the mouth which apparently were not lacerated or bleeding were not cauterized. Antirabies vaccine was not given. On October 13, twenty-one days after the bite, the child had onset of illness with fever and vomiting. The following day she was removed to a hospital in Buffalo. She died October 17. Tissue from the brain removed at necropsy showed the presence of typical Negri bodies.

Foundation and Hospital Set Up for Rheumatic Fever. —A hospital for the care and treatment of children and other minors suffering from rheumatic fever and rheumatic heart disease has been established in Syracuse as the nucleus of the recently incorporated Rheumatic Fever Foundation of Onondaga County. The new hospital, a composite medical center, home, school and church, on November 6 had 12 patients; its total capacity is 40. According to *Health News,* the foundation was incorporated October 26. Its objectives include:

To establish and maintain a hospital and a dispensary for the treatment of children and minors suffering, or suspected to be suffering, from rheumatic fever and rheumatic heart disease and their complications, and a coordinated clinic for the follow-up care and study of discharged hospital patients.

To establish and maintain for research purposes a laboratory for the study of the causes of rheumatic fever and rheumatic heart disease and their treatment.

To cooperate with other established agencies and institutions, both public and private, interested in the prevention, detection and treatment of rheumatic fever and its complications.

The work of the foundation is being administered under the supervision of seven directors, two of whom are physicians: Dr. John G. F. Hiss, Dr. Brewster C. Doust and Messrs. Frederick K. Kilian, William A. Barry, Arthur G. Lyons, Carl A. Bubie and Richard F. Harrison.

New York City

Cancer Committee Names Executive Director to Expand Activities. — Mr. Savel Zimand has resigned as director of the bureau of health education of the city department of health to become executive director of the New York City Cancer Committee. In his new position Mr. Zimand will direct the committee's proposed program of expansion, which will include education of the public with regard to the prevention, early diagnosis and treatment of cancer, informing the public where such services can be secured and promoting the establishment of more adequate facilities.

Physician Chosen "Outstanding Citizen."—Dr. Thomas H. Curtin, chairman of the Bronx Inter-Faith Council, was honored November 28 at a meeting of the Bronx Rotary, Lions and Kiwanis clubs at the Concourse Plaza Hotel. Dr. Curtin had been selected by fourteen Bronx civic and professional organizations as the "outstanding citizen" of the Bronx in 1945. Dr. Curtin, who came to the Bronx in 1900 as coroner's physician and later helped to found the Bronx Eye and Ear Infirmary, received a plaque for his civic, philanthropic and professional activities. He also received a citation from the Inter-Faith Council.

OHIO

Changes in Health Officers. — Dr. Robert A. Evans, Columbus, resigned as temporary health officer of Franklin County December 1. He has held the position for three years. Dr. Homer L. Mitchell, health commissioner, has now returned from service in the army.

Dwight Palmer in Charge of New Department.—Dr. Dwight Palmer, associate professor of neurology and psychiatry, Ohio State University College of Medicine, Columbus, has been made professor and chairman of a newly created department of neurology and psychiatry, it was announced December 3. Dr. Palmer has been a member of the staff of the university since 1927.

Neuropsychiatric Institute Organized.—The Neuropsychiatric Institute of Cleveland was recently organized at 10528 Park Lane, Cleveland 6. The project was started by a number of psychiatrists who felt that adequate psychiatric care could be given in a teamwork arrangement that included psychologists and such laboratory facilities as electroencephalography. Likewise, the institute was set up to give ambulatory electrocoma (shock) treatment. Organized by the staff, the institute is self supporting. Seminars in neuropsychiatry have been established for physicians of the Veterans Administration in the region and for local practicing physicians. Dr. Joseph L. Fetterman is director and Dr. Maurice D. Friedman associate director.

OKLAHOMA

Executive Secretary Takes Over Postgraduate Work.—With the resignation of Mr. L. W. Kibler as field director of the postgraduate course conducted by the postgraduate committee of the Oklahoma State Medical Association, Mr. Dick Graham, formerly executive secretary, has assumed the duties, and the course will continue under his direction.

Wann Langston New Dean at Oklahoma.—Dr. Wann Langston, professor and chairman of the department of medicine and for more than thirty years affiliated with the University of Oklahoma School of Medicine, Oklahoma City, has been appointed acting dean of the school, filling the vacancy that occurred with the death of Dr. Tom Lowry, December 11. Dr. Langston graduated at the University of Oklahoma School of Medicine in 1916. He was medical superintendent of the University Hospital from 1923 to 1926, becoming on Jan. 1, 1927 superintendent, a position he held for about a year, when he went into private practice.

TEXAS

Chairman of Anatomy Named.—Donald Duncan, Ph.D., professor of anatomy at Louisiana State University School of Medicine, New Orleans, has been appointed professor and chairman of the department of anatomy at the University of Texas Medical Branch, Galveston, effective February 1.

GENERAL

New Secretary for Industrial Nurses.—Miss Elizabeth Andrews, R.N., has been named executive secretary of the American Association of Industrial Nurses, effective January 1, succeeding Mrs. Gladys L. Dundore, R.N., resigned.

Society News.—The fifth International Assembly of the International College of Surgeons will be held at Lima, Peru, March 25-27 in the Hospital Obrero under the general chairmanship of Dr. Francisco Graña. Those in the United States desiring to present papers should address Dr. Albert A. Berg, 10 East 73d Street, New York. General information may be obtained from Dr. Max Thorek, Secretary General of the College, 850 Irving Park Road, Chicago 13.——The American Gastroenterological Association will hold its annual meeting at the Hotel Claridge, Atlantic City, May 24-25. Dr. Jacob Arnold Bargen, Rochester, Minn., is secretary.——The seventeenth annual convention of the Aero Medical Association of the United States will be held at the Edgewater Beach Hotel, Chicago, April 7-9.——The American College of Physicians will hold its annual meeting in Philadelphia May 13-17 with headquarters at the Philadelphia Municipal Auditorium.

Seminar for Specialists in Allergy.—The American Academy of Allergy announces its seminar for specialists in allergy on January 7-11 under the joint auspices of the American Academy of Allergy and the New York Postgraduate Medical School. Among the speakers will be:

Dr. Albert Vander Veer, New York, Hay Fever.
Dr. Sanford B. Hooker, Boston, Chemistry of Antibody and Antigen.
Dr. Russell C. Grove, New York, Sinusitis in the Diagnosis and Treatment of Allergic Diseases.
Dr. Paul Klemperer, New York, Pathologic-Anatomic Aspects of Allergy.
Dr. Samuel M. Feinberg, Chicago, The Importance of Molds in Allergic Conditions.
Dr. McKeen Cattell, New York, Pharmacology of Drugs Used in Allergic Conditions.
Dr. Horace S. Baldwin, New York, The Importance of Differential Diagnosis in the Practice of Allergy.
Dr. Frances Pascher, Brooklyn, The Treatment of Allergic Dermatosis.
Dr. Joseph Harkavy, New York, Vascular Allergy.
Dr. Robert A. Cooke, New York, The Antibodies Concerned in Skin Sensitive Allergies.

Lasker Award Goes to Psychiatrists.—The Lasker Award was conferred jointly November 1 on Dr. John R. Rees, consultant in psychiatry to the directorate of psychiatry of the British army, and Major Gen. George Brock Chisholm, deputy minister of national health, federal department of national health and welfare of Canada. The presentation was made by Gen. Omar N. Bradley, administrator of veterans' affairs, at the annual luncheon meeting of the National Committee for Mental Hygiene. The Lasker Award of $1,000, established in 1944 by the Albert and Mary Lasker Foundation, is given annually through the committee for meritorious service and significant contributions to promoting mental health and increasing public understanding of mental hygiene. Each year the award is made for distinguished service in some special aspect of the field of mental hygiene which is of current significance, the honor going in 1945 for service in the field of rehabilitation. The recipient of the award is chosen by members of a jury anonymous to one another as well as the general public, selected annually for competence to judge accomplishment in a particular field. The National Committee for Mental Hygiene reelected its officers at the recent meeting.

International Association of Allergists.—Dr. Fred W. Wittich, secretary-treasurer, American College of Allergists, announces that, after planning and study by representative officers of various existing national allergy societies in different countries, the International Association of Allergists has been incorporated. Pan American and Pan European sections will be affiliations of the association. It is planned to hold the first international congress in Paris in 1948, when universal standards of terminology and classification of allergies will be adopted. Preliminary to this program it is proposed that the same subjects will be the theme of the first Pan American Congress to be held under the auspices of the American College of Allergists at its next annual meeting, tentatively set for Oakland, Calif., June 28-30. The members of the first executive committee, which will compose the temporary group of officers until the election in 1948, are Drs. Karl Figley, Toledo, Ohio; Jonathan Forman, Columbus, Ohio; Guido Ruiz-Moreno, Buenos Aires, Argentina; Abelardo Saenz, Montevideo, Uruguay; Pasteur Vallery-Radot, Paris, France, and Dr. Wittich, chairman, Minneapolis. Executive offices and headquarters of the new association have been set up adjoining the offices of the college. The address is 401 La Salle Medical Building, Minneapolis 2.

Government Services

Consultant Named for Veterans Administration

A group of thirteen consultants has been appointed to the staff of the Veterans Administration Hospital, Hines, Ill. The new appointees are drawn mainly from the faculties of the medical schools at Northwestern University and the University of Illinois as well as from officer personnel being separated from the medical corps of the army. The appointment of these consultants are a phase of the program of Major Gen. Paul R. Hawley, acting surgeon general, Veterans Administration, and Dr. Paul B. Magnuson, Chicago, newly appointed director of postgraduate instruction and research. The names of the physicians are Lindon Seed, Oak Park, Ill., Harold C. Lueth and Richard H. Young, both of Evanston, Ill., Frederick C. Hoebel, River Forest, Ill., and John Martin, Edwin M. Miller, John H. Mohardt, Frederick W. Fitz, Earle I. Greene, Robert M. Jones, Charles B. Puestow, Mitchell A. Spellberg and Everett L. Strohl, all of Chicago.

New Medical Classification for the Library of Congress and the Army Medical Library

Based on studies for new alternative schedules for medicine, class R, and for the preclinical sciences in class Q for the Library of Congress System, a new classification will soon be put into effect. The Army Medical Library plans an early classification of its collection under the new schedule. Because its is expected that alterations, additions and subtractions will be found necessary, it is judged wise not to make the provisional first draft of the classification available for general distribution. The process of classifying the Army Medical Library collection should result in establishing the system in permanent form. It will then be possible to publish it as an integral part of the Library of Congress classification schedules. It should be noted that the notation for these new schedules has been planned so that it will not conflict with the use of those in the original Library of Congress scheme for class Q and class R. The material from these classes has been assigned to heretofore unused portions of the alphabet, the new Q divisions occupying QS to QZ, while medicine proper (the former R sections) utilizes the wholly vacant letter W. This will make it possible for libraries already using the present Library of Congress classification for medicine and related sciences to continue to do so or, if they prefer, to apply the new system, leaving their previous collections as they are. The Library of Congress will announce its policy with respect to use of the new schedules before they are published. Keyes D. Metcalf, Litt.D., is chairman of the committee on a new medical classification for the Library of Congress and the Army Medical Library. Miss Mary L. Marshall is responsible for the actual work on the new classification under a committee representing the Harvard College Library, the Library of Congress and the Army Medical Library survey committee.

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Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 1, 1945.

Rehabilitation of Patients with Head Injuries

The immense experience with head injuries during the war has advanced knowledge of the subject. Much work has been done at the Military Hospital for Head Injuries at St. Hugh's, Oxford. During the past eighteen months the Nuffield Provinsional Hospitals Trust, the Ministry of Pensions and the Radcliffe Infirmary, Oxford, have been considering some plan for dealing with the after-treatment of head injuries. As a result of modern neurosurgery and chemotherapy, men with brain wounds who formerly would have died have survived. Many have regained speech, sight and mental faculties; paralyzed limbs have recovered. These results have been achieved through courage and perseverance by the patients, a favorable environment and the guidance of a skilled team of workers. But recovery is often incomplete, and frequently severe permanent disability remains. Inability to cope with ordinary conditions of civilian life and the fear of being a drag on their families cause anxiety, disappointment and frustration.

If these men are to make their contribution to the community within the limitations imposed by their disabilities, it is necessary to assess their physical, mental and vocational capacity for work while they are in the hospital. Later they must be given facilities for simple training in various forms of work more advanced and more satisfying to the desire to be useful than occupational therapy alone can afford. Finally for the gravely disabled a permanent center must be provided which will give medical care with apropriate forms of useful work. These men can live with their families around the center whose protection they need.

The following steps are now being taken to deal with the problem: The Ministry of Pensions recognizes that head injury patients comprise a group for which special provision must be made and that further research on the best methods of rehabilitation is necessary. For this research the Radcliffe Infirmary, Oxford, with the aid of a donation of $100,000 from the Nuffield Provincial Hospitals Trust, has appointed Dr. W. Ritchie Russell. Before the war he was lecturer in neurology at Edinburgh University and during the war worked at the Military Hospital for Head Injuries, Oxford. He will work in close collaboration with the departments of Oxford University, already engaged in the study of lesions of the nervous system. He will give specialized assistance and advice to the Ministry of Pensions. By these means the latest methods of treatment will be made available to pensioners.

The Health Conditions of European Countries

An encouraging picture of health in Europe has been drawn by Dr. George Stuart, head of the Medical Information Branch of the United Nations Relief and Rehabilitation Administration. Although present conditions favor epidemic diseases, the situation is not nearly so dangerous as after the last war. Smallpox is negligible; typhus has been almost eliminated from Europe west of the Elbe-Adriatic line. In several western countries and especially in Germany there is a high incidence of diphtheria, typhoid and dysentery, largely the result of malnutrition in overcrowded and ruined areas. Typhoid is the most dangerous disease in Europe, reaching in September thirty times its normal incidence in Germany. Tuberculosis has also increased, especially in Italy, Yugoslavia and Greece, where its frequency is ten times as great as in Britain. Twenty years of venereal disease control has been nullified during the war, for there is a three to nine fold increase of syphilis in most European countries, and up to a twenty fold increase in Germany. Malaria is of epidemic proportions only in Greece, but it is hoped that modern methods of control can almost eradicate it there in two or three seasons.

UNRRA is doing great work to combat these diseases. Medical supplies are now flowing into all the countries with which the organization is concerned, although transport difficulties often delay distribution. From Britain alone 60,000 hospital beds, with all the necessary equipment, have been sent. By the end of September UNRRA had shipped over 11,000 tons of medical supplies into Europe.

ITALY

(From Our Regular Correspondent)

NAPLES, Nov. 20, 1945.

Health and Nutrition

The standard of health in Italy is gradually improving. Health conditions were appalling during the war, owing to the scarcity of food and to the threatening spread of epidemics in the period immediately following the armistice.

In 1939 Hitler promised the peoples of the Axis a "blitz victory" and Mussolini did not then enforce food rations. In 1941, however, this was suddenly done with a vengeance, as soon as the probability of a long conflict was apparent. Only 150 Gm. of poor bread and a general daily ration that supplied each person with about 1,200 calories a day was provided. As a result all Italians began to lose weight rapidly, notwithstanding the supplements from black market sources, which were very modest, since the Nazis exploited Italy even in food. At first adults from 40 to 50 years of age began to lose weight from 12 to 25 per cent and in some cases up to 30 Kg., then young persons, children and finally the pathologically obese. The latter resisted weight loss during the years 1940 and 1941, but in 1943 not a single case of obesity was encountered from the Alps to Sicily. This indicates that insufficient food can weaken the endocrine system. They all lost weight according to a typical pattern, notwithstanding the various "types" and constitutions. The restrictions of proteins and fats caused a water imbalance, which resulted in abundant urine; this in turn led one to suspect a form of diabetes insipidus, never confirmed, however. A new restriction of carbohydrates (macaroni, bread and rice) caused those who were losing weight to become weaker and weaker. Because of the altered carbohydrate function, loss of immunity to the staphylococcic and the streptococcic infections occurred. An outbreak of abscesses and boils followed.

Malnutrition then influenced latent constitutional ailments. The most unusual forms of nonpulmonary tuberculosis appeared in adults. Thirty year old subjects were affected by meningitis, sinovitis and primary pleurisy. At the same time life in the air raid shelters, where many actually dwelt on account of the nerve racking, continuous bombardments, gave rise to mass contagion with scabies. The general thinning down took on such terrible forms that Mussolini gave orders to the editors of the chief dailies not to say a word about it, so as to avoid alarming the population. We managed, however, to get round this order, by a strange coincidence. The London *Lancet* had once published a flattering editorial on a book of mine on preventive medicine, which had been published in Bologna. Mussolini read this book. He liked it and addressed a personal letter to me declaring that the book was absolutely in keeping with his own ideas. As a result I was able to carry out a program and publish articles on preventive medicine in wartime in important political journals, exhorting the readers to get calories from nonrationed and unusual food, such as horse flesh, to add to the rations vegetables, which increased immunity because of the vitamins they contained, and to eat generously of fruit rich in mineral salts. Readers were warned against

fighting weight loss by taking substances such as cod liver oil which were apt to become "diet toxic" on account of the scarcity of certain vitamin groups to counterbalance their action. In spite of the malnutrition, death by starvation was not registered in Italy as in other belligerent European countries owing to the fact that there was a natural source of vitamin B_1 in the abundant fresh vegetables.

BUENOS AIRES

(From Our Regular Correspondent)

Nov. 15, 1945.

Intrasplenic and Intracanalicular Administration of Penicillin

Dr. Mariano R. Castex and Dr. Eduardo L. Capdehourat of Buenos Aires recently reported on the intrasplenic and intracanalicular administration of penicillin. The intrasplenic route was used in a case of abscess of the spleen complicating convalescence from bilateral pulmonary abscess. The intracanalicular route was resorted to after operation in 2 cases of suppurative calculous cholecystitis. Intrasplenic injection was performed with a needle 6 or 8 cm. long, with a caliber of 0.10 or 0.12 mm. after local anesthesia of the skin. Penicillin in isotonic solution of sodium chloride, isotonic dextrose solution, the patient's whole blood, plasma, blood serum or sulfonamide solution (sulfadiazine, sodium sulfamerazine, and glucothiazole) may be used for intrasplenic injections. Any one of the solutions is well tolerated by the patient. The solution is prepared by dissolving 100,000 units of penicillin in 10 or 20 cc. of isotonic solution of sodium chloride or isotonic dextrose solution. When whole blood, plasma or blood serum is used, the penicillin is placed in 5 cc. of either isotonic solution of sodium chloride or isotonic dextrose solution, and whole blood, plasma or blood serum is added to the solution to a total quantity of 10 or 20 cc. Whole blood is withdrawn directly into the syringe which contains the penicillin solution. This precaution is necessary to prevent coagulation. The simultaneous administration of soluble sulfonamide preparations and penicillin is of value. The physical, chemical and biologic properties of the two drugs are reciprocally increased and bacterial resistance to either sulfonamide or penicillin is simultaneously controlled. The daily dose varies from 50,000 to 300,000 Oxford units. Each injection varies from 10 to 20 cc. and is given slowly. The solution is warmed by wrapping the syringe in cotton soaked in boiling water. The total dose of penicillin depends on the clinical condition. When the syringe strikes an abscess the pus or purulent material is aspirated before the injection.

Penicillin through the biliary ducts can be administered either by continuous drip or by instillation through the drainage tube after surgical opening of the gallbladder in suppurative calculous cholecystitis. The continuous drip is administered through a very fine sound which is introduced through the drainage tube, leaving a space between sound and tube for elimination of suppuration. Instillation is made directly through the drainage tube, which is closed after instillation with a clamp of the Mohr or Kocher type and kept closed for two hours after each instillation. During local administration of penicillin the patient is maintained in the Trendelenburg position, which facilitates passage of the drug deep into the liver and into the intrahepatic biliary ducts by gravitation. Penicillin passes through the common bile duct into the duodenum and the portal system and returns to the liver. Within the liver penicillin passes through the excretory canalicular system and reaches the fine lobes within the liver and the constituent cells of Remak's column through the portal system. By this procedure the hepatocystic system is in constant contact with penicillin. Bile has no influence on the effect of penicillin. A daily dose of 100,000 units is sufficient. The total dose depends on the clinical condition. Penicillin for intracanalicular use is dissolved in isotonic solution of sodium chloride, dextrose solution, plasma or blood serum. Soluble sulfonamide preparations are contraindicated because they are toxic for the liver. The quantity of solvent for the continuous drip is 100 cc. and for instillation 20 or 30 cc. Instillation is performed slowly to prevent distention of the biliary ducts. It is well tolerated, without pain and local irritation. It is indicated after operation in cases of biliary infection, suppurative angiocholitis or empyema of the gallbladder. Penicillin by the intracanalicular route is also indicated, as a routine after operation, on the excretory system of the liver with drainage in order to prevent local infection. Peptones and the products of cellular disintegration from the effect of the pyogenic course have no influence on the effect of the drug.

Studies on Old Age

A committee for studies on old age was recently appointed. Dr. Bernardo A. Houssay is the president. Drs. José González Gale, E. Eduardo Krapf, Francisco Romero and Pablo Osvaldo Wolff are members. The aim of the committee is to study the origin and general significance of the phenomena which cause old age and to extend this study to the various fields of gerontology, the organic life and inorganic nature. The somatic, mental, physical, chemical, anthropologic and philosophic aspects of the problem will be discussed. A society, to work in connection with the committee, has been organized. It will include physicians and others in the various sciences related to medicine.

Personal Items

Dr. Jose Arce, dean of the Faculty of Medicine of the University of Buenos Aires, recently resigned the position of dean of the faculty and of regular professor of thoracic surgery. Dr. Gonzalo Bosch, teacher of psychiatrics of the faculty, was appointed new dean of the faculty.

Dr. Pasteur Vallery Radot of France was the president of the French Cultural Mission in Argentina, after which he returned home. Recently the Superior Council of the National University of Buenos Aires gave him the diploma of "Doctor Honoris Causa" for his contributions to medicine.

Dr. Bruno Guenther, professor of physiopathology of the School of Medicine of the University of Conception, Chile, was recently appointed head of the Instituto de Fisiologia of the same faculty.

Marriages

George Washington Fishburn to Miss Nellie Mae Embree McIlwaine, both of Richmond, Va., in Petersburg, October 27.

Charles E. Sherwood II, New York, to Dr. Sarah E. Prindle of New Haven, Conn., in Branford, Conn., August 20.

Walter Boudinot Rahmanop, Manchester, N. H., to Mrs. Beatrice Rowe Allen in Bedford, September 26.

Frederick Conrad Gevalt Jr., Boston, to Miss Sally Willits Young of Scarsdale, N. Y., November 10.

Robert James Ruark, Raleigh, N. C., to Mrs. Cleste Edgerton Guess in Chapel Hill, September 30.

Hiram Robertson Elliott Jr., Fairfield, Ala., to Miss Naomi Favor of Selma, September 29.

Archibald E. Senesac to Miss Louise Frances Salles, both of New Bedford, Mass., August 25.

Mark P. Fecher, Dayton, Ohio, to Miss Lorraine Marguerite Sebek of St. Louis, September 29.

David L. Pressly, Statesville, N. C., to Miss Anita Arneson in San Antonio, Texas, October 6.

Brian T. Shorney, Detroit, to Dr. Magda E. Puppendahl of St. Louis, November 3.

Rodger Browning Smith to Miss Mary Maxwell, both of Madison, Wis., recently.

Delmar O. Shields, Detroit, to Dr. Wilma R. Farrington of St. Louis, October 6.

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Deaths

Isaac Donaldson Rawlings, Chicago; Northwestern University Medical School, Chicago, 1893; born in Carrollton, Ill., April 29, 1869; member of the American Medical Association; emeritus member of the Illinois State Medical Society; at one time a member of the faculty of his alma mater, where he served as assistant demonstrator in anatomy, assistant demonstrator in bacteriology and clinical medicine, instructor in clinical medicine and associate in medicine; formerly associated with the U. S. Public Health Service; joined the city health department in 1899 as a medical inspector and later appointed assistant chief medical inspector and chief of the bureau of communicable diseases; director, state department of health from 1921 to 1929; author of two volumes of "Rise and Fall of Disease in Illinois"; died in Newton, Kan., October 21, aged 76, of a fractured right femur and humerus received in a fall.

Rowland Godfrey Freeman ✠ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1886; professor emeritus of pediatrics at the New York University College of Medicine; member of the American Pediatric Society, New York Academy of Medicine and the Association of American Physicians; secretary from its formation in 1901 of the milk commission of the Medical Society of the County of New York until 1917 when he became chairman; consultant in pediatrics at the Sea View Hospital, Staten Island, Roosevelt Hospital, New York Foundling Hospital and the Willard Parker Hospital; author of "Elements in Pediatrics"; died November 14, aged 86, of pneumonia.

Rowland Foreman Webb ✠ Grand Rapids, Mich.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1897; fellow of the American College of Surgeons; member of the American Association of Railroad Surgeons; member of the active senior surgical staff of the Butterworth Hospital, where he had been chief of staff three times, chief of surgery twice and where he had been intern and resident in surgery; on the courtesy staffs of the Blodgett Memorial Hospital and St. Mary's Hospital; surgeon to the Pere Marquette Railroad, New York Central Railroad and Michigan Central Railroad; died at the University Hospital, Ann Arbor, September 23, aged 70, of pneumonia.

George Eugene Dodge, San Marino, Calif.; University of Virginia Department of Medicine, Charlottesville, 1896; surgeon during Boer War on the hospital ship *Maine;* on the surgical staff of the New York Hospital in 1899; fellow of the American College of Surgeons; died September 19, aged 72, of coronary thrombosis.

Robert Hewitt Feldt ✠ Milwaukee; Northwestern University Medical School; Chicago, 1934; assistant medical director of the Northwestern Mutual Life Insurance Company; on the staff of the Milwaukee Children's Hospital and on the associate staff of the Columbia Hospital, where he died October 8, aged 36, of rheumatic heart disease.

Amos Thomson Harrington, West Hartford, Conn.; Harvard Medical School, Boston, 1910; member of the American Medical Association; also a clergyman; physician to the Old Peoples' Home and associate physician at the Hartford Hospital, where he died October 1, aged 75, of cerebral thrombosis and hypertensive cardiovascular disease.

Arshavir Ignatius, Maywood, Ill.; University of Illinois College of Medicine, Chicago, 1916; began active duty as a captain in the medical corps, Army of the United States, on Aug. 15, 1942; assigned to Camp Gordon Johnston, Fla.; promoted to major; service terminated in 1944 because of physical disqualification; died September 12, aged 58.

Morrell Mallory Jones, Pontiac, Mich.; Detroit College of Medicine and Surgery, 1915; member of the American Medical Association; served in France during World War I; on the staffs of the Pontiac General and St. Joseph Mercy hospitals; died in the Henry Ford Hospital, Detroit, September 28, aged 54, of coronary occlusion.

Milton Emanuel Leckrone, Rochester, Ind.; Indiana University School of Medicine, Indianapolis, 1925; fellow of the American College of Surgeons; member of the American Medical Association; served an internship and as assistant superintendent of the City Hospital in Indianapolis; medical director and owner of the Woodlawn Hospital; died October 1, aged 45, of coronary embolism.

James Michael MacEvitt, Babylon, N. Y.; Long Island College Hospital, Brooklyn, 1891; member of the American Medical Association; past president of the medical board of St. Mary's Hospital and of the Holy Family Hospital, Brooklyn; died in the Southside Hospital, Bay Shore, September 3, aged 82, of generalized arteriosclerosis.

John Herbert Mudgett, Philadelphia; Dartmouth Medical School, Hanover, N. H., 1896; member of the American Medical Association; died in the Lankenau Hospital September 24, aged 73, of myocardial failure.

George Davenport Parkhurst ✠ Fair Haven, Vt.; Bellevue Hospital Medical College, New York, 1897; for many years trustee of the Fair Haven Carnegie Library; died in the Mary McClellan Hospital, Cambridge, N. Y., September 4, aged 70, of carcinoma of the stomach.

William Courthope Poussette, Los Angeles; Trinity Medical College, Toronto, Ont., Canada, 1897; died in the Presbyterian Hospital-Olmsted Memorial September 3, aged 76, of bilateral lobar pneumonia.

Benjamin Pushkin ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1914; assistant professor of neurology at his alma mater; specialist certified by the American Board of Psychiatry and Neurology, Inc.; on the staff of the Sinai Hospital; died September 8, aged 56, of coronary thrombosis and cardiovascular disease.

William Joseph Quigley, Chicago; Rush Medical College, Chicago, 1913; member of the American Medical Association; formerly assistant professor of medicine at the University of Illinois College of Medicine and clinical professor of medicine at the Loyola University School of Medicine; on the staffs of the Cook County Hospital and St. Anne's Hospital; died at his home in Oak Park, Ill., October 1, aged 59, of cerebral hemorrhage and coronary thrombosis.

Edward Wilson Rawls, Portsmouth, Va.; Medical College of Virginia, Richmond, 1909; member of the American Medical Association; for many years on the staff of the King's Daughters' Hospital; died September 6, aged 61, of coronary thrombosis.

John Wesley Calhoun Stephenson, St. Petersburg, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; fellow of the American College of Surgeons; served as a colonel on the governor's staff of Kentucky and during World War I; died in the Mound Park Hospital September 7, aged 60, of coronary occlusion.

Charles Kimball Stewart, Moorcroft, Wyo.; University of Michigan Homeopathic Medical School, Ann Arbor, 1893; served as local health officer; formerly on the staff of the Sheridan County Memorial Hospital in Sheridan; died September 12, aged 76, of cerebral hemorrhage.

Eugene Adelbert Sullivan, Amboy, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; served as health officer; president of the First National Bank; on the staff of the Amboy Public Hospital, where he died September 15, aged 68, of cerebral thrombosis and hypertension.

Frederick William Walker, Los Angeles; Rush Medical College, Chicago, 1890; died September 6, aged 86, of senility.

Frederick William Walz, Cleveland; Homeopathic Hospital College, Cleveland, 1878; served as a member of the board of education, county coroner and councilman; died in the Fairview Hospital September 20, aged 86, of arteriosclerosis.

Letitia A. Westgate, Mendota, Ill.; Northwestern University Woman's Medical School, Chicago, 1892; died September 30, aged 78, of uremia.

Bine Whitlatch ✠ Milan, Ind.; Kentucky University Medical Department, Louisville, 1905; served as director of the State Bank and member of the school board; died September 9, aged 70, of coronary occlusion.

Margaret Barclay Wilson, Washington, D. C.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1893; formerly professor of physiology and hygiene at the Hunter College in New York; achieved a collection of about four thousand textbooks and a similar number of pamphlets in twenty different languages on foods, cookery, gastronomy and allied subjects, which she presented to the New York Academy of Medicine; died in October, aged 82, of acute congestive heart failure.

Olen L. Wise, Forest, La.; Memphis (Tenn.) Hospital Medical College, 1910; coroner of West Carroll parish; died in a sanitarium in Monroe September 7, aged 62.

Joseph Barnett Workman ✠ Ware Shoals, S. C.; Medical College of the State of South Carolina, Charleston, 1907; died in the Greenwood (S. C.) Hospital September 20, aged 67, of injuries received in an automobile accident.

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DIED WHILE IN MILITARY SERVICE

George Hudson Ebbett, Houlton, Maine; McGill University Faculty of Medicine, Montreal, Que., Canada, 1936; born in Hodgdon, Maine, July 21, 1909; member of the American Medical Association; interned at the Monmouth Memorial Hospital in Long Branch, N. J.; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Dec. 2, 1939; began active duty in the medical corps, Army of the United States, on Feb. 10, 1941; the first assignment was at Fort Benning, Ga., which was followed by duties in various training centers in the United States; promoted to captain on June 1, 1942; in August 1943 went overseas and was recalled to the United States in 1944, when he was assigned to the orthopedic service in the hospital at Westover Field, Mass., where he died July 27, aged 36, of second degree burns received when his home caught fire.

Donald Renwick Ferguson, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1916; born in Swarthmore, Pa., Nov. 21, 1889; member of the American Medical Association; fellow of the American College of Physicians; specialist certified by the American Board of Internal Medicine; professor of clinical medicine at his alma mater; served as president of the Philadelphia County Homeopathic Medical Society; on the staffs of the Children's Hospital and St. Luke's Hospital; consulting cardiologist at the Women's Homeopathic Hospital; visiting physician at the Hahnemann Hospital; served overseas during World War I; began active duty as a major in the medical corps, Army of the United States, on Sept. 25, 1942; died in Station Hospital, Camp Shanks, N. Y., August 27, aged 55, of cerebral hemorrhage.

Walter Robinson Finton, Jackson, Mich.; University of Michigan Medical School, Ann Arbor, 1936; born in Jackson, Mich., July 9, 1911; member of the American Medical Association; interned at the Hurley Hospital in Flint; began active duty as a first lieutenant in the medical corps, Army of the United States, on Sept. 22, 1942; trained at Miami, Fla.; stationed at the Army Air Base at Walla Walla, Wash., for four months; on June 1, 1943, assigned to the Second Air Force and sailed for European duty; served in England, Ireland, France and Germany; promoted to captain; died in the Sixty-Eighth General Hospital in France July 15, aged 34, of acute infectious hepatitis.

Glenn Ellwood Harrison, Mason City, Iowa; State University of Iowa College of Medicine, Iowa City, 1928; born in Prescott, Iowa, Feb. 24, 1903; member of the American Medical Association and the American Academy of Pediatrics; on the staff of the Park Hospital; interned at the University Hospitals in Iowa City, where he served a residency; served a residency at the Duke Hospital in Durham, N. C.; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Jan. 6, 1930; began active duty on Dec. 12, 1940 as a captain, assigned as chief of the contagious disease service, Base Hospital, Camp Joseph T. Robinson, Ark.; became the surgeon of the eighth port of embarkation at Boston; commander of the Thirty-Fifth Hospital unit at Corsica, which was awarded the meritorious service unit plaque; promoted to major, lieutenant colonel and colonel; died August 31, aged 42, of coronary heart disease.

Lewis McCurdy Jones, Opelika, Ala.; Emory University School of Medicine, Atlanta, 1937; interned at the Hillman Hospital in Birmingham, where he served a residency in obstetrics and gynecology; began active duty as a first lieutenant in the medical corps, Army of the United States, on Dec. 15, 1940; promoted to captain on Oct. 29, 1941; served overseas with a general hospital in England, 1943-1944; killed June 17, aged 32, in an automobile accident near Camp Rucker, Ala.

Martin Joseph Keane ✠ Riverdale, Md.; Georgetown University School of Medicine, Washington, D. C., 1930; interned at the Georgetown University Hospital in Washington, D. C.; formerly instructor in bacteriology and in clinical surgery at his alma mater; commissioned a captain in the medical corps, Army of the United States, on Nov. 20, 1944; died in the Walter Reed General Hospital, Washington, D. C., September 20, aged 40, of congestive heart failure.

Howard Dillon Maxwell ✠ Alliance, Ohio; Ohio State University College of Medicine, Columbus, 1930; interned at the Youngstown Hospital in Youngstown; began active duty as a captain in the medical corps, Army of the United States, on September 1942; promoted to major, Nov. 7, 1944; served overseas in New Guinea and in the Philippines; died at the Fletcher General Hospital in Cambridge, Ohio, August 12, aged 42, of pneumonia.

Arch Lavere Oldaker, Lakewood, Ohio; Western Reserve University School of Medicine, Cleveland, '929; member of the American Medical Association; interned at St. Vincent's Charity Hospital in Cleveland; formerly resident physician at the Lakewood City Hospital; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 13, 1929; promoted to captain, June 23, 1939; began active duty in 1941; died in the Philippine Islands May 8, 1942, aged 41, of malaria.

John Josiah Redfield, North Platte, Neb.; University of Nebraska College of Medicine, Omaha, 1942; interned at the Eastern Maine General Hospital in Bangor, Maine; began active duty as a first lieutenant in the medical corps, Army of the United States, on Aug. 10, 1943; died in Columbus, Ga., August 22, aged 28, of coronary sclerosis.

Robert Lewis Screen, Martinsville, Va.; Meharry Medical College, Nashville, Tenn., 1942; interned at the City Hospital in Winston-Salem, N. C.; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 7, 1944; sailed for overseas duty with the 92d division in October 1944; killed in Italy April 8, aged 27.

James McGeough Sullivan, San Francisco; St. Louis University School of Medicine, 1923; diplomate of the National Board of Medical Examiners; member of the American Medical Association; lieutenant colonel, medical corps, Army of the United States; died in Honshu Island, Camp Fukuoka, Japan, Jan. 31, 1945, aged 52, of acute colitis.

Walter Low Tatum, Salisbury, N. C.; Jefferson Medical College of Philadelphia, 1922; born in Salisbury, N. C., June 5, 1899; interned in St. Joseph's Hospital in Philadelphia; past president of the Rowan-Davie Counties Medical Society; served as county coroner for many years; formerly chief of staff of the Rowan Memorial Hospital; served as president of the Fourth Corps Area council of the National Reserve Officers Association of the United States; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on April 28, 1925; became a captain on July 8, 1929, a major on Aug. 1, 1934 and a lieutenant colonel on Oct. 17, 1940; began active duty on Feb. 28, 1941; died in Frankfort, Germany, August 1, aged 46, of arteriosclerotic arterial hypertension.

Wiley Kellett Thorne, Mountain Grove, Mo.; Washington University School of Medicine, St. Louis, 1943; interned at the St. Louis City Hospital; commissioned a first lieutenant Dec. 12, 1943 in the medical corps, Army of the United States; died in Saipan June 20, aged 26, when a carbine was accidentally discharged.

Thomas Edgar Wyatt Jr., Marshfield, Wis.; Vanderbilt University School of Medicine, Nashville, Tenn., 1935; born in Elkton, Ky., on May 21, 1910; member of the American Medical Association; interned at the New York Hospital in New York; served a residency in surgery at the Vanderbilt University Hospital in Nashville, Tenn.; an associate surgeon with the Marshfield Clinic; fellow of the American College of Surgeons; commissioned a first lieutenant in the medical reserve corps of the U. S. Army in 1935 and began active duty as a captain on Oct. 25, 1940; promoted to major; left for overseas service early in January 1942; while on foreign service attended the British army specialist schools of neurosurgery in Oxford, maxillofacial surgery in East Grinstead and chest surgery in London; an operating surgeon with the first task force to land in northern Ireland in 1942 and later with advance medical units in Normandy, France, Belgium, the Netherlands and Germany, with the First and Ninth armies, 41st Evacuation Hospital; among the decorations awarded him were the Bronze Star and citations from the king of England and the President of the United states; died on train near Valley Forge, Pa., August 12, aged 35, of edema of lungs with dilatation of the heart.

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Correspondence

RESTLESS LEGS

To the Editor:—The editorial "Restless Legs" in the issue of November 24 was of great interest because I too have had this condition. My observations, both of myself and of my patients, convince me that this symptom is associated with either chronic nonspecific prostatitis or testosterone deficiency or a combination of the two. This symptom is probably more common than one might suspect, but for some unknown reason patients with prostatitis seldom volunteer the information that they have this complaint. About half of my prostatitis patients will admit having "restless legs" if carefully questioned, and treatment directed solely at the prostate gives relief.

A general practitioner seldom sees enough of one type of patient to be able to draw any accurate conclusions. However, this observation may be of interest to those who can study a sufficient number of these cases and can make statistical studies from which valid conclusions can be drawn.

J. A. WINTER, M.D., St. Joseph, Mich.

To the Editor:—Meralgia paresthetica, Roth's or Bernhardt's disease, was described many years ago (Goldstein, Hyman I.: *Am. J. M. Sc.* **162**:720 [Nov.] 1921). While typically this syndrome affects the thighs laterally and anteriorly, it appears to resemble in some respects the paresthesias of "restless legs" (Wittmaack-Ekbom syndrome). The editorial in THE JOURNAL, November 24, discusses crurum paraesthetica and the painful crawling cold sensations, but no mention is made of this similarity to Roth's or Bernhardt's disease, and perhaps mention should be made of Solomon Solis-Cohen's "vasomotor ataxia" (*Am. J. M. Sc.* **107**:135, 1894), Osler's "crural paresthetica" (Osler, William: On Certain Unusual Forms of Paresthetica Meralgia, *J. Nerv. & Ment. Dis.* **24**:131, 137, 1897), Erb-Hunt-Kirstein's dysbasia angiosclerotica and Moebius's akinesia algera. Perhaps Ekbom (*Acta med. Scandinav.*, supplement 158, 1945) has only revived previously described syndromes by Wittmaack (1861), Roth (1895) and Bernhardt (1895), as so frequently happens in medical literature.

HYMAN I. GOLDSTEIN, M.D., Camden, N. J.

SUBACUTE BACTERIAL ENDOCARDITIS

To the Editor:—The article "Penicillin in Subacute Bacterial Endocarditis" (THE JOURNAL, November 24, p. 841) by Flippin et al. interested me very much, especially their advice to eradicate secondary foci of infection. They enumerated the tonsils, teeth and middle ear as probably the most frequent sites of focal diseases. To these sites I still firmly believe the spleen should be added as the most likely source of reinfection and the site from which the greatest amount of bacterial toxins is absorbed (Reisman, David; Kolmer, J. A., and Polowe, David: Splenectomy in the Treatment of Subacute Bacterial Endocarditis, *Am. J. M. Sc.* **192**:475 [Oct.] 1936. Polowe, David: Splenectomy in the Treatment of Proved Subacute Bacterial Endocarditis, *Arch. Surg.* **38**:139 [Jan.] 1939).

It is truly stirring to live in an age that is witnessing the conquering of subacute bacterial endocarditis. The controlled use of heparin will probably add to the percentage of cures effected by penicillin. And the judicious eradication of secondary foci of infection such as the tonsils, teeth, middle ear and spleen may bring the total of permanent cures closer to the 100 per cent mark, where we'd like to see it. The person who was the subject of my report in 1939 is still alive and well.

DAVID POLOWE, M.D., Paterson, N. J.

RECURRENT HEADACHE RESULTANT FROM MALARIA

To the Editor:—I was interested in reading the case report of recurrent headache resultant from malaria appearing in the October 27 issue of THE JOURNAL.

Dr. Kaplan's experience with headache during the course of chronic malaria is, as he states, not altogether unusual. It is my observation, however, that the headaches seldom attain the severity he reports for his case, and they are not present or prominent in the vast majority of cases.

In his comment Dr. Kaplan states that "malaria in the Pacific area is a common disease and will become much more common in the United States as more of our fighting men return from zones where they were exposed to the Anopheles maculipennis mosquito." I find it difficult to agree with much of this sentence. Malaria is certainly common on the malarious islands of the Pacific, but the vast Central Pacific, including Guam, Saipan, Iwo Jima, Samoa, Hawaii and many other important bases is malaria free. Anopheles maculipennis mosquitoes do not occur in the Pacific or in eastern Asia, the common Pacific vectors during this war being Anopheles farauti, Anopheles punctulatus and possibly Anopheles minimus, Anopheles hyrcanus, Anopheles sinensis and Anopheles sundaicus in the Philippine Islands and in Asia.

Malaria in the armed forces has declined to extremely low levels as compared with the incidence in 1943 and early 1944 and is at present comparatively rare in naval hospitials. Vast numbers of men with malaria have returned to the United States since early in 1943 without any significant outbreaks or increase of the disease during this time. The majority of men now being returned either have not had malaria or have late and relatively quiescent cases. It must be appreciated that the bulk of troop malaria was acquired early in the war before effective malaria control was established. These early cases have had two or three years to subside, and our statistics clearly show that such subsidence has occurred. In that the last three years have failed to produce the often predicted rise in malaria as a result of exotic infection, it is sincerely doubted that it will occur now or in the immediate future.

Dr. Kaplan goes on to say that in a number of cases with recurrent headaches but without parasitemia he was able to demonstrate parasites invariably by blood film examination after administration of 1 Gm. of quinine sulfate or 0.12 cc. of epinephrine. The use of quinine as a provocative measure has not to my knowledge ever been reported before and requires confirmation. The general experience is that administration of quinine will cause such parasites as are in the circulation to disappear immediately. There was a general rule in many overseas hospitals during this war that in cases of uncomplicated malaria antimalarial drugs would not be administered until after a laboratory diagnosis of malaria was established. Epinephrine as a provocative agent is of dubious value. While it has had its adherents during the present war, several very capable hospital groups had no success whatever with it, and the statement that it invariably induces a demonstrable parasitemia would be difficult to support in any circumstance. The possibility, of course, exists that Dr. Kaplan assumed that other men with headaches who did not respond to his provocative measures did not have malaria.

FRED A. BUTLER, Commander (MC), U.S.N.

This communication has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this communication are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Abortion Induced by Sanipractor.—Mrs. Dennis consulted one of the defendants, a woman sanipractor, Feb. 13, 1940, relative to a backache. Apparently the sanipractor administered no treatments on that visit, merely suggesting to her patient that the discomfort might be caused by a cyst, tumor or tipped uterus. However, the sanipractor instituted a course of biweekly treatments February 20, which continued through March 22 and which consisted of "adjustments" to her back, electrotherapy administered by a device which used pads placed on her back and abdomen, and treatments with a vibrating device having a belt against which the patient leaned, turning herself so that contact was made around the abdomen and back. The patient frequently suggested to the sanipractor that she might be pregnant, but the sanipractor assured her she was not although the practitioner made no tests, such as the Friedman or Aschheim-Zondek test, which concededly is from 94 to 98 per cent accurate. Apparently about March 31, to allay the patient's suspicions as to pregnancy, the sanipractor examined her internally and, according to her testimony,

> She took an instrument, a long instrument, and poked up into the uterus and it was very painful, it was awfully painful. And she said—well, she said, "If you was pregnant the mouth of the uterus wouldn't be open." And she drew blood. I saw blood on the end of that instrument.

Seemingly the patient then began to hemorrhage and the sanipractor packed her vagina, telling her that "it would hold the uterus in place, that that was what was causing the pain." The patient continued to hemorrhage and apparently on April 6 visited the sanipractor, who told her "the uterus was tipped badly and it was polyps that was passing and that was good" and that when those would pass away "it would be just fine." She then packed the vagina again "to hold the uterus in position, it would take the pressure, relieve that pain." Against the sanipractor's advice, the patient started on an automobile trip but after going a few miles the pain became so unbearable that she returned to town and was attended by the sanipractor's husband, apparently another sanipractor, who had her hospitalized immediately, where she was attended by a physician. The physician found her in the process of aborting and performed a curettement. Six weeks later he removed both fallopian tubes and a cyst from the right ovary. Subsequently the patient and her husband sued the sanipractor and her husband for malpractice. From a judgment in favor of plaintiffs for $5,000, the defendants appealed to the Supreme Court of Washington.

The defendants in general questioned the sufficiency of the evidence to sustain the verdict on which the judgment was based. They claimed that the testimony of the patient respecting the invasion of the uterus was inadmissible because she could not have testimonial knowledge. We will assume, said the court, without deciding, that this testimony was essential to the patient's case and that without it the evidence would be insufficient to sustain the verdict. This is for the reason that the other treatments, stoutly maintained as not being contraindicated in cases of pregnancy, might have left the case in the realm of speculation. However, as to this evidence of invasion of the uterus, the sanipractor stands on a denial rather than on the proposition that an abortion following an invasion of the uterus would be speculative as to its cause. The invasion of the uterus is based solely on the testimony of the patient as previously set out. We quote the sanipractor's first contention:

> Picture the patient lying flat on her back on a table and the doctor working over her. Could the patient see where the instrument was "poked"? It would be a human impossibility for her to so do unless she was a contortionist. How did she know then, by the sense of feeling? I think not, for it is common knowledge that there are other cavities and orifices entering into the vaginal canal, such as the urethra, and I do not believe the sense of touch is developed to such an acuteness that the layman could know whether an instrument was inserted up into the uterus or some other opening or cavity within the vaginal canal.

No objection was made to the admission of the testimony as quoted earlier in this opinion, but in any event we would not be prepared to say that the patient lacked testimonial knowledge as to the things testified to.

The sanipractor further contended that the testimony of the patient "as to where the instrument was poked" invades the realm of the expert and is beyond the knowledge of ordinary laymen and was therefore inadmissible. However, said the court, no objection was made to the testimony when it was introduced. In any event, we are not prepared to say that it falls in the realm of things beyond common experience of women in general, or requires such knowledge, skill or training not possessed by women generally. Lastly, the appellants contended that the trial court in examining the sanipractor commented on the evidence and that this was reversible error. As an example, the following questions by the court and answers by the sanipractor on the witness stand were relied on:

"The Court: What do you mean? This treatment was not what?

"The Witness: There is none of it that is contraindicated in pregnancy, none that we wouldn't use in a pregnancy case.

"The Court: Did you use the electrical vibrating belt machine? A. I never use that on a pregnant woman. It wouldn't tend to reason—

"The Court (interrupting): Well, I asked you if you used it in this case?

"The Witness: No. It would be entirely foolish for me to first go to work and pack her and work to stop the flow and then put on an electric vibrator to start a flow. I would be working against myself.

"The Court: Well, did you diagnose her case as pregnancy?

"The Witness: I didn't diagnose her case. It yet had not been diagnosed when she quit. She was feeling so much better. She had just been in the office thirty days from the day she started treatment.

"The Court: You had not yet diagnosed her?

"The Witness: No, I had checked her on the machine and followed up to see whether there was any albumin. She had two checks on that."

In any event, said the Supreme Court, the appellants cannot raise this question when there was no objection made in the trial court. However, the court could see no impropriety in the trial court's conduct. It is beyond controversy, said the court, that a trial court has wide discretionary powers in the trial of a cause and is not prohibited from questioning a witness. Such a course, it is true, may constitute a comment on the evidence where it is improperly done. To constitute a comment on the evidence, however, it must appear that the attitude of the court toward the merits of the cause must be reasonably inferable from the nature or manner of the questions asked and things said. This record, in our opinion, does not disclose any grounds for the jury to infer that the court had or expressed an opinion.

The judgment against the sanipractors was affirmed.—*Dennis v. McArthur, 158 P. (2d) 644 (Wash., 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Dec. 29, page 1288.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various Centers, Feb. 4-6. Part III. Various Centers, March. Exec. Sec., Mr. E. S. Elwood, 225 S. Fifteenth St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY & SYPHILOLOGY: *Written. Group B.* April 22. *Oral. Group A and B.* June 6-8. Final date for filing application is March 1. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, May 27. Final date for filing application is Feb. 1. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Jan. 18-22 and New York, April 10-13, San Francisco, June 22-25, and Chicago, Oct. 9-12. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: Spring 1946. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY: Chicago, May 24-25. Final date for filing application is February 1946. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N. W., Washington 6, D. C.

AMERICAN BOARD OF UROLOGY: *Oral.* Chicago, February 1946. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1936 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Annals of Internal Medicine, Lancaster, Pa.

23:309-490 (Sept.) 1945

Acute Nonspecific Myocarditis. S. Candel and M. C. Wheelock.—p. 309.
Meningococcic Meningitis Treated with Sulfadiazine and Sulfamerazine: Three Year Study. L. K. Sweet, Edith Dumoff-Stanley and H. F. Dowling.—p. 338.
*Coccidioidomycosis in Southern California: Report of New Endemic Area, with Review of 100 Cases. F. M. Willett and A. Weiss.—p. 349.
*Pathology of Sickle Cell Disease. R. C. Murphy Jr. and S. Shapiro. —p. 376.
Diagnosis of Beriberi Heart Disease. M. A. Blankenhorn.—p. 398.
*Treatment of Bronchiectasis with Chemotherapy and Allergy Management. J. W. Thomas, H. S. Van Ordstrand and C. Tomlinson. —p. 405.

Coccidioidomycosis.—The observation of a number of cases of coccidioidomycosis in soldiers engaged in a construction project near Banning, Calif., suggested to Willett and Weiss the existence of a new endemic region. They made repeated skin tests on 573 soldiers (Negro and white) performing a dusty type of work at the edge of the desert. One hundred and thirty-five "change overs" from negative to positive skin reactions were found, of which 83 were hospitalized with acute pulmonary coccidioidomycosis. The 135 cases which showed a change in the skin reaction from negative to positive constitute the epidemiologic group by which the area of endemicity was established. The region in question is a triangular one bounded by Banning and Needles, Calif., and Yuma, Ariz. In the eight months subsequent to the epidemiologic survey 17 additional patients with acute pulmonary coccidioidomycosis have been hospitalized from the desert area, thus making a total of 100 hospitalized cases, almost equally divided between Negro (49) and white patients (51). The disease appeared to be more severe in Negroes. Cavities in 2 white soldiers either closed or showed a tendency to close at the last examination. Of 4 cases of cavitation in Negroes, only 1 closed. The disseminated form, which is by far the most serious type, occurred in 4 patients, all of whom were colored and 1 of whom died. This patient had a generalized miliary dissemination involving virtually every organ and system of the body except the gastrointestinal tract and central nervous system. Of the other 3 patients, 2 had dissemination to bone and the last dissemination to muscle. The average case of acute pulmonary coccidioidomycosis has a good prognosis for complete recovery. There is no "specific" for the disease. Measures such as acetylsalicylic acid, codeine in small doses or other mild analgesics are usually quite sufficient for the acute symptoms. Vaccines have been used with questionable results. Surgical excision has been effective in local abscesses caused by the fungus.

Sickle Cell Disease.—Murphy and Shapiro studied a patient with sickle cell disease for twelve months. He was a Negro aged 21 who complained of generalized muscle and joint pains. He had had frequent and severe attacks of what were believed to have been episodes of acute rheumatic fever since the age of 3 years. The first blood count established the diagnosis of sickle cell disease. During the first ten days the clinical picture continued unchanged, with a low grade fever and migratory pains. Thereafter the patient's course was characterized by the so-called active and latent phases alternately of sickle cell disease. Altogether there were seven "active" periods. Five of these occurred in the form of dramatic crises. The remaining two assumed a less striking pattern. Accompanying the crises were fever and disseminated pains produced by multiple infarctions, which may have been visceral as well as skeletal. Hemolytic aspects representing resolution of thrombi and disintegration of the sickled cells are prominent. The diffuse infarcts stem from the abnormal shape and other physical characteristics of the sickled erythrocyte. During the time a susceptible cell retains the normal shape it is indistinguishable from normal erythrocytes. The act of sickling, however, renders it elongated and rigid, making capillary passage difficult. As the sickled forms gain prominence in the blood stream they eventually form a mechanical impaction, delaying the capillary flow, and thrombosis takes place. This constitutes the fundamental pathologic lesion of sickle cell disease. All erythrocytes of a subject with the asymptomatic sickle cell trait are capable of assuming the abnormal form and differ from those of persons who exhibit the crises only in that they possess a higher threshold of sickling. Susceptible red cells exhibit increased tendency to sickling as they mature. The abnormal form tends to increase progressively during the quiescent periods until mechanical obstruction and thrombosis of capillaries occur. With each thrombosis there are liberated into the circulation certain coagulating bodies (thrombin, thromboplastin) which further enhance thrombosis and accelerate the precipitation of sickled red cells. A self-perpetuating sickle cell "crisis" is thereby inaugurated, which gains momentum until the major part of the sickled cells are destroyed and the blood is again "rejuvenated" by release into the circulation of immature normally shaped cells. Anticoagulant therapy appears to be inadequate to prevent a crisis. If at the abrupt onset of a crisis anticoagulants might postpone the thrombotic tendency, they could not prevent the increased tendency of the cells to sickle as they grow older, which tendency leads inevitably to the vascular occlusions.

Chemotherapy and Allergy Management in Bronchiectasis.—Thomas and his associates found that of 190 consecutive cases of bronchiectasis approximately one half had allergy of the respiratory tract. A clinical study was made of 75 selected cases of bronchiectasis to evaluate sulfonamide therapy and allergy management in treatment. In 55 of these cases an allergy of the respiratory tract was an etiologic or complicating factor. Twenty-three patients received sulfonamide drugs as the chief or only therapeutic measure and were observed for four months to four years. Twenty-two of these patients showed definite improvement with reduction of cough and expectoration. Twenty-one cases treated chiefly or wholly with allergy management were observed for from one to four and one-half years. Fifteen of this group showed frank improvement with reduction in cough and expectoration. In 31 cases combined allergy and sulfonamide therapy was used. Twenty-six cases were found to show at least 25 to 100 per cent improvement in cough and expectoration. They were observed for six months to five years. Exacerbations were frequent in all groups, but almost invariably if sulfonamide drugs were repeated when symptoms first began to return to their former severity continued improvement could be maintained. Likewise, exacerbations occurred often when the allergy program was discontinued.

Journal National Malaria Society, Tallahassee, Fla.

4:155-278 (Sept.) 1945. **Partial Index**

Significance of Palpable Spleens in Malarious Areas of Low Endemicity. R. L. Smith.—p. 155.
Spleen Survey as Applied to Measure of Malaria in United States: Review of Literature. S. S. Spicer.—p. 165.
*On Probability of Soldiers with Pacific Plasmodium Vivax Malaria Infecting Anopheles Quadrimaculatus. R. B. Watson.—p. 183.
Discussion on Caribbean Malaria Control. J. M. Henderson.—p. 189.
Malaria Control in Nonendemic Area. H. L. Felton, R. C. Barnes and A. Wilson.—p. 201.
Review of Equipment Used in Applying Malaria Control Measures on Impounded Waters in Tennessee Valley. C. C. Kiker and R. E. Sparkman.—p. 209.
*Detection of Plasmodia of Human Malaria in Blood Films by Fluorescence Microscopy. R. L. Metcalf.—p. 223.
Description of Anopheles (Nyssorhynchus) Dunhami, New Species from Upper Amazon Basin. O. R. Causey.—p. 231.
Observations on Seasonal Occurrence and Abundance of Anopheles Quadrimaculatus Say. G. H. Bradley and R. F. Fritz.—p. 251.
Detailed Observations on Life History of Anopheles Quadrimaculatus. G. G. Keener Jr.—p. 263.

Possibility of Soldiers with Pacific Plasmodium Vivax Infecting Anopheles Quadrimaculatus.—The studies here reported by Watson were carried out at the Kennedy General Hospital. Anopheles quadrimaculatus mosquitoes were fed on

soldiers with relapsing Plasmodium vivax infections presumably acquired in Pacific war areas. Feeding of mosquitoes was done without reference to gametocyte levels, number of relapses experienced, origin of strains or any other variable. Some patients had received two 0.6 Gm. doses of quinine or totaquine before the mosquitoes were fed. After incubation for fifteen days in an air conditioned room these mosquitoes were examined for salivary gland infections. An overall infection rate of 11.8 per cent was found for 1,426 mosquitoes which had been fed on a total of 117 cases, representing 87 different patients. The highest infection rate (17.7 per cent) was obtained in lots of mosquitoes fed on patients with asymptomatic parasitemia. The infection rates for mosquitoes fed on patients who had received treatment were not significantly different from those fed on patients who had received no treatment. It is concluded that many, if not all, strains of P. vivax from Pacific war areas can be transmitted by A. quadrimaculatus and that returning soldiers with such infections may be responsible for the establishment in this country of epidemic or endemic foci of imported vivax strains.

Diagnosis of Malaria by Fluorescence Microscopy.—Metcalf reports a method for fluorescent microscopic identification of the plasmodia of human malaria in blood films. Of fourteen fluorochromes studied, berberine sulfate and rivanol gave the best visualization of plasmodia with the fluorescent microscope. Because of its simplicity the method might be of value in routine malaria surveys. The employment of fluorescent dyes as histologic stains, which are then irradiated with ultraviolet rays, produces a light source in the microscopic object itself. This results in perfect conditions for image formation in microscopy in that refractive difficulties inherent in condensing lenses are eliminated. This fact, coupled with the dark field, produced results of extreme sharpness and clarity. The parasites appear as luminous bodies within the dark outlines of erythrocytes; they can be readily observed even in rapid scanning of the slide.

Journal of Pediatrics, St. Louis

27:1-298 (Sept.) 1945

*Etiology of Kaposi's Varicelliform Eruption. R. J. Blattner, F. M. Heys and Mary L. K. Harrison.—p. 207.
Growth Charts for Use in Pediatric Practice. R. L. Jackson and Helen G. Kelly.—p. 215.
Bone Growth in Congenital Myxedema: Use of Serial Roentgenograms of Os Radius in Diagnosis and Regulation of Therapy During Infancy. P. V. Woolley Jr. and R. W. McCammon.—p. 229.
Acute Disseminated Lupus Erythematosus with Seven Year Recovery: Case Report. D. M. Horstmann.—p. 235.
Edema with Hypoproteinemia Due to Congenital Defect in Protein Formation: Case Report. B. Schick and J. W. Greenbaum.—p. 241.
Comparative Study and Significance of Tuberculin Patch and Mantoux Tests in Children. H. Goldstein.—p. 245.
*Hemolytic Disease of Newborn (Erythroblastosis Fetalis): Clinical Analysis of 55 Cases, with Special Reference to Pathogenesis, Prognosis and Therapy. Martha F. Leonard.—p. 249.
Anemia of the Newborn: Case Report. J. T. Leslie.—p. 265.
Staphylococcus Albus Hemolyticus Meningitis in Infant: Treatment with Sulfonamides Orally with Recovery. H. H. Clemens.—p. 267.
Streptococcal Viridans Meningitis Followed by Pneumococcal Meningitis in Same Patient with Recovery. G. E. Brockway and M. H. Jacobs.—p. 273.
Waterhouse-Friderichsen Syndrome: Report of 8 Cases at Children's Hospital, Washington, D. C. A. Ceballos, T. V. Frank and W. F. Simpson Jr.—p. 281.
Obturator (Acrylic) for the Newborn Infant with Cleft Palate. I. E. Schapiro, A. Walden and G. A. Carman.—p. 288.

Kaposi's Varicelliform Eruption.—Blattner and his co-workers at the St. Louis Children's Hospital treated a patient who had Kaposi's varicelliform eruption. A virus etiology had been suggested, but no etiologic agent had been identified. The authors made an attempt to isolate the infectious agent from the cutaneous lesions of their patient, a boy aged 15 months who had an atopic eczema since the age of 6 weeks and an acute exanthem associated with high fever for five days. Fluid removed from cutaneous vesicles on the fifth and sixth days of illness was cultured by bacteriologic methods, pure cultures of Streptococcus hemolyticus and Staphylococcus aureus resulting. Material from these vesicles was inoculated on the scarified cornea of a rabbit. Lesions were noted within three days. On the fourth day the rabbit cornea was removed, washed in sterile saline solution and triturated in tryptose-phosphate broth in an agate mortar. After centrifugation, the supernatant fluid was Seitz filtered and inoculated into mice intracerebrally and onto the retracted chorioallantois of embryonated hen's eggs. The mice developed convulsions and died in from two to four days, and by the fourth day numerous small, pocklike lesions were observed on the chorioallantoic membranes. Other samples of vesicular fluid inoculated directly onto the chorioallantoic membrane produced lesions in from four to five days. The fact that the virus was isolated not only by means of the rabbit's cornea but also directly on the chorioallantois would seem to exclude a latent herpes virus which might have been reactivated in the rabbit by experimental manipulation. The virus was identified as a member of the herpes group. The authors conclude that a strain of herpes virus is the etiologic agent involved in at least some of the cases diagnosed as Kaposi's varicelliform eruption. Strains of herpes were isolated and identified in two other laboratories.

Hemolytic Disease of the Newborn.—Leonard reviewed records of 55 infants with hemolytic disease who were treated in the pediatric service between July 1938 and June 1944. The infants showed most or all of the characteristic clinical signs: jaundice, progressive anemia, hepatomegaly, splenomegaly, hemorrhage, edema, excessive numbers of nucleated red blood cells in the circulating blood and the typical pattern of Rh negative blood in the mother and Rh positive blood in the father and baby. Only liveborn babies were included. The clinical picture in these 55 cases varied greatly. A high incidence (44 per cent) of nonspecific diarrhea was noted. The effects of transfusion with Rh positive, Rh negative blood and bank blood not typed for the Rh factor were compared. Immediate results following transfusion in raising hemoglobin and improving clinical condition were good, but Rh negative blood transfusions caused a better sustained rise in hemoglobin, fewer reactions and lower mortality. Nineteen infants died. One of the chief causes of death was hemorrhage. Jaundice out of proportion to or in the absence of anemia was attributed to impaired liver function. This thesis was supported by low prothrombin levels responding poorly to vitamin K administration, fatty degeneration and necrosis of the liver. Plasma infusions were preferred in this type of patient. The prominence of hemorrhagic tendencies in patients with hemolytic disease of the newborn was emphasized and its relation to low prothrombin levels demonstrated. Administration of vitamin K to donors of Rh negative blood was suggested as a means of raising the prothrombin levels of affected infants.

Journal of Urology, Baltimore

54:1-220 (Aug.) 1945

Massive Renal Fibrolipoma: Report of 2 Cases. C. Tahara and E. Hess.—p. 107.
Renal Hypoplasia with Hydroureter and Primary Amenorrhea: Report of Case. F. M. Huff and W. P. Boger Jr.—p. 116.
Pericillin: An Adjunct in Nephrolithiasis: Case Report. H. Bodner and M. K. Moulder.—p. 123.
Renal Disease in AAF Regional Station Hospital. H. R. Newman.—p. 126.
Primary Carcinoma of Ureter, with Special Reference to Hydronephrosis: Review of Literature and Report of Unusual Case. J. A. Lazarus and M. S. Marks.—p. 140.
Case of Ureterocele with Stone Formation in Ureter, Ureterocele and Bladder. H. R. Sauer.—p. 158.
Late Invasion of Bladder and Prostate by Carcinoma of Rectum or Sigmoid. G. D. Oppenheimer.—p. 162.
*Transurethral Prostatic Resection in Patients with Advanced Renal Insufficiency. L. F. Greene and G. J. Thompson.—p. 166.
Suprapubic Prostatectomy: Revised Operation. I. J. Zimmerman.—p. 174.
Sacrococcygeal Teratoma in Infant of Five Months Causing Acute Urinary Obstruction. S. R. Woodruff and J. A. Begner.—p. 177.
*Rarity of Stones in Urinary Tract in Wet Tropics. A. Davalos.—p. 182.
Tumors of Urinary Drainage Tract: Urothelial Tumors. M. M. Melicow.—p. 186.
Studies in Urinary Calculosis. L. D. Keyser.—p. 194.
Urea and Sulfonamides in Treatment of Gonorrhea. J. G. Menville and C. W. Ross.—p. 211.

Transurethral Prostatic Resection in Advanced Renal Insufficiency.—Greene and Thompson review observations on 54 patients who entered the hospital with renal insufficiency due chiefly to prostatic obstruction and on whom transurethral pros-

tatic resection was performed in the presence of severe renal insufficiency. In every case the prostatic resection was performed at a time when the blood urea, though reduced, still remained 100 mg. per hundred cubic centimeters or more; the value of 100 mg. per hundred cubic centimeters to denote renal insufficiency was selected because this represents severe impairment of renal function. The authors conclude that transurethral prostatic resection can be performed safely on patients suffering from advanced renal insufficiency and these patients are no longer obliged to lead a "catheter life." The important features of management are (1) improvement or restoration of the acid base metabolism by the intravenous administration of suitable fluids and the treatment of anemia by blood transfusions, (2) maintenance of a urinary output of 2,000 to 3,000 cc. daily, thereby producing a fall in the nitrogenous waste products present in the blood, (3) drainage by urethral catheter for as short a period as possible, suprapubic cystotomy with its attendant mortality not being necessary, (4) operation at the first indication that the value for the blood urea is no longer falling but has become stabilized and (5) completion of the resection within forty-five minutes. The period of preoperative and postoperative hospitalization for patients with advanced renal insufficiency is comparatively short when they are treated by transurethral prostatic resection. Longevity following prostatic resection among patients of this group warrants the procedure. Gastrointestinal symptoms due to renal insufficiency have been relieved in spite of the fact that renal function remains impaired.

Stones in Urinary Tract in Wet Tropics.—According to Davalos it has long been known that urinary stones are much more prevalent in some countries and districts than in others, and this unequal distribution has given rise to numerous theories as to the influence of climate, soil and the dietary habits of a people on the formation of stones. The geographic distribution of lithiasis in South America has received much less study than it has in other parts of the world, but available statistics indicate that urinary stones are common throughout the southern part of the continent, especially in the northern and central districts of Chile and in many sections of Argentina. In Brazil cases of urinary stone are common in the northeastern portion and numerous in the southern section but are rare in the Amazon Valley. The latter region has the same climate as the Ecuador Mountains—that is, hot and humid the year round—and the living conditions and diet of the inhabitants are essentially similar. Panama is another locality with approximately the same climatic conditions and dietary habits, and here also lithiasis is infrequent. In investigating the reasons for the almost complete absence of urinary stones in the tropical regions of Ecuador, Davalos approached the subject from three angles: (1) the local geographic conditions, (2) the diet of the people and (3) urine examination. Among 60,000 patients observed in the southern part of Ecuador there was not a single one with urinary lithiasis. The author stresses that in the wet tropics the high temperature induces profuse perspiration, which, by eliminating a considerable part of the metabolic output through the skin, materially decreases the eliminatory strain on the kidneys. The low urinary p_H prevents the growth of urea splitting organisms (proteus, ammoniae, coli), and there is no precipitation of phosphates and carbonates in the urinary tract. It would appear that, in tropical Ecuador at least, climatic conditions are primarily responsible for the rarity of urinary lithiasis, since the poorly balanced vitamin deficient diet of the inhabitants, far from preventing stone formation, is conducive to it.

Union Médicale du Canada, Montreal

74:1355-1504 (Oct.) 1945

Rh Factor: Origin, Research and Significnace. A. Bertrand.—p. 1360.
Contact Roentgenotherapy in Malignant Lesions of the Mouth. G. Pinsonneault.—p. 1368.
Transurethral Resection. R. Cauchon.—p. 1370.
Postoperative Atelectasis or Post-Traumatic Bronchoscopy and Oxygenotherapy. V. Latraverse.—p. 1373.
Three Cases of Allergic Drug Dermatitis. H. Smith.—p. 1377.
Intestinal Amebiasis: Case. V. Noel.—p. 1381.
Placenta Previa: Case. M. Ferron.—p. 1383.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

26:137-216 (June) 1945

Toxicity of Sulfadiazine and Sulfaguanidine to Macrophages in Vitro. F. Jacoby.—p. 137.
Effect of Tetrathionate on Bacterial Growth. R. Knox.—p. 146.
*Renal Blood Flow in Experimental "Crush Syndrome." C. A. Keele and D. Slome.—p. 151.
Influence of Chemical Constitution on Antibacterial Activity: Part II. General Survey of Acridine Series. A. Albert, S. D. Rubbo, R. J. Goldacre, M. E. Davey and J. D. Stone.—p. 160.
Age and Dosage in Induction of Breast Cancer in Mice by Mouse Mammary Tumor Agent. L. Dmochowski.—p. 192.
Production, Purification and Titration of Neurotoxin of Shigella Dysenteriae. C. G. Anderson, A. M. Brown and J. C. Macsween.—p. 197.
Influence of Coagulase on Phagocytosis of Staphylococci. J. H. Hale and W. Smith.—p. 209.

Experimental "Crush Syndrome."—Keele and Slome studied renal blood flow in cats following experimental limb compression. They found that following release after four or five hours of complete limb ischemia in chloralosed cats there is a fall in blood pressure and a great reduction of renal blood flow. When the blood pressure is reduced to the same extent by hemorrhage there is a smaller reduction in renal blood flow than with limb ischemia. The reduction in renal blood flow following release of ischemic limbs may be, in part at least, responsible for the renal tubular damage of the "crush syndrome" type.

British Journal of Surgery, Bristol

33:1-100 (July) 1945

Medical and Surgical Aspects of "The Forty-Five": Jacobite Rising of 1745-1746. G. Gordon-Taylor.—p. 1.
*Immersion Foot Syndrome. C. C. Ungley, G. D. Channell and R. L. Richards.—p. 17.
Major Amputation Stump in Health and Disease. F. G. S. Strange.—p. 31.
Asepsis in Prostatectomy. W. H. Hey.—p. 41.
The Abdominal Wound in the Field. G. Blackburn and C. G. Rob.—p. 46.
Treatment of Cervical Collar Stud Abscesses with Skin Involvement. H. Bailey.—p. 53.
Pathology of Colloid and Nodular Change in Thyroid Gland and Its Application to Surgery of Nodular Goiters. L. Martin.—p. 62.
Late Treatment of Dorsal Injuries of Hand Associated with Loss of Skin. J. B. Cuthbert.—p. 66.
Addisonian Anemia Following Enteroanastomosis. J. E. Richardson.—p. 71.
Experiences in Prophylaxis and Treatment of Clostridial Infections in Casualties from Invasion of Europe. T. C. Patterson, C. Keating and H. W. Clegg.—p. 74.

Immersion Foot Syndrome.—Ungley and his associates consider immersion foot as a disorder characterized by chilling of the tissues distinct from freezing or frost bite. The condition is most frequently seen in shipwreck survivors but may result from any circumstances in which there is prolonged exposure of the extremities to moist cold. Trench foot presents a clinical picture similar to that of immersion foot, and the two conditions are akin if not identical. The immersion foot syndrome has four phases. During the period of exposure the limbs are numb. In the second or prehyperemic phase the sensory disturbances which occurred during exposure continue. For some hours after rescue survivors are frequently unable to maintain their balance or, if able to walk, they describe the sensation as "walking on air" or "walking on cotton wool." There is a "stocking" type of sensory disturbance. During the third or hyperemic stage the previously cold, pulseless feet become hot and flushed. The onset of the hyperemic stage may be accelerated by warming the feet, a procedure the authors condemn. With hyperemia there is continuous diffuse pain. Patients are restless and require large doses of sedatives and analgesics. About the seventh to tenth day after rescue, pains of a shooting or stabbing character not unlike the lightning pains of tabes dorsalis occur radiating from the center of the foot to the tips of the toes. These pains are aggravated by heat and relieved by cold; they are most severe when the feet are dependent, after exercise and when the feet are warming, e. g. after getting into bed at night. Exceptionally, attacks

of stabbing pain may be precipitated by micturition, defecation, coughing or yawning. In the early hyperemic stage movements of the ankle and toes are hampered by swelling. As edema subsides, weakness and wasting of the intrinsic muscles of the foot become apparent and the toes become clawed. When patients begin to walk they have a flat-footed springless gait. The fourth or posthyperemic stage may be absent; mild cases pass from the phase of hyperemia to normal. In the moderately severe cases the first indication that a change is about to occur is that the feet, previously consistently warm, are cool. Later still the feet become permanently cold and are "cold sensitive." In some cases the feet are also heat sensitive; after exercise or when the paticnt is in bed the feet become unbearably hot and he is forced to take measures to cool them. Hyperhidrosis frequently accompanies the cold sensitivity. Cold therapy is of value for the relief of pain in the hyperemic stage but should not be used in the prehyperemic stage. Sympathectomy and other measures designed to increase the peripheral circulation should not be employed immediately but may have a place in the treatment of the later cold sensitive state.

Quarterly Journal of Medicine, Oxford

14:125-182 (July) 1945

Epidemiology of Infective Hepatitis in Some Units of British Army in Sicily and Great Britain, 1943-1944. A. M. McFarlan.—p. 125.
Spinal Osteoporosis of Unknown Origin. H. J. Burrows and G. Graham. —p. 147.
Renal Function and Prognosis in Benign Hypertension. M. McGeorge. —p. 171.

Archives Francaises de Pédiatrie, Paris

2:89-132 (No. 3) 1944-1945

Ocular Hypertelorism. M. Péhu.—p. 89.
Hyperalbuminosis in Clear Cerebrospinal Fluid of Infants with Low Viability. J. Lévesque and L. Callerot.—p. 93.
Anemia of Newborn: II. Attenuated Forms and Erythrolytic Crisis at Birth. M. Lelong, R. Joseph and Miss M. M. Garnier.—p. 101.
Enormous Polycystic Hemolymphangioma of Great Omentum Simulating Bloody Ascites. M. Févre and Lecointe.—p. 107.
*Periarteritis Nodosa or Kussmaul-Maier Disease: First Case Diagnosed in Infant During Life; Rapid Recovery from Therapy with Sulfapyridine and Acetylcholine. J. Legros.—p. 112.

Periarteritis Nodosa in an Infant.—Legros reports the occurrence of periarteritis nodosa in a girl aged 9 months. There was edema of the lower extremities, a macular rash with numerous purpuric spots and palpable small subcutaneous nodules. The muscles of the lower and of the upper extremities were extremely tender. Necrosis of the purpuric areas occurred within twenty-four hours. Diagnosis of periarteritis nodosa was made. Biopsy of a nodule revealed a circumscribed necrosis of the epidermis with clear demarcation of the living portion of the skin. The necrotic portion of the skin was characterized by perivascular infiltration with alteration of all the layers of the corium. The nodule appeared as a cone with the base composed of necrotic epidermis and at the summit an artery with the lumen obstructed by a fibrinous thrombus, poor in cells. The intima appeared partly disorganized. The two accompanying veins were not involved. The bacteriologic examination was negative except for a hemolytic streptococcus, which was cultured from the pharynx. A positive reaction was produced in the patient and in her mother by a subcutaneous injection of a heated culture of this streptococcus, while a negative reaction was observed in 4 other infants. Treatment consisted of one-fourth tablet of sulfapyridine given eight times daily and of 0.1 Gm. of acetylcholine administered twice daily by the intramuscular route. This therapy was continued for five days. Within two days the temperature dropped from 104 F. to normal and the edema was considerably reduced. The edema and muscle pain subsided completely within the next three days. The necrotic crusts separated, leaving scars which resembled those seen occasionally following chickenpox. The rapid healing of the cutaneous lesions was striking. This supports the concept of an allergic origin of the disease, which was suggested also by the positive cutaneous reaction of the patient and by the negative reaction of other infants. The concept of sepsis due to the streptococcus is suggested by the effectiveness of chemotherapy. Sulfonamide therapy appears to be indicated in the acute stage of this disease. Two cases of periarteritis nodosa in infants have previously been published but were diagnosed only on postmortem examination. The author's case is the first diagnosed during life.

Presse Médicale, Paris

53:441-452 (Aug. 18) 1945

Grave Malnutritions at Present Time: Bioclinical Remarks on Athrepsia. G. Mouriquand.—p. 441.
*Treatment of Nitrogen Deficiency of Various Origins by Means of Protein Hydrolysates. L. Chevillard, R. Jacquot and J. Roche.—p. 442.
Significance of Presence of Tubercle Bacilli in Sputum of Patients with Pulmonary Tuberculosis Treated in Sanatorium. J. C. Levaditi. —p. 443.

Protein Hydrolysates in Nitrogen Deficiencies.—Chevillard and his associates point out that it is possible to supply the nitrogen needs of man by the administration of sufficient amounts of a mixture of amino acids. Since, for economic reasons, it is not feasible to do this with pure amino acids, investigators have resorted to protein hydrolysates. Those which must be derived from complete proteins (casein or meat) are of two types. One type, the hydrolysates resulting from enzymatic digestion, can be employed without any addition, for their amino acids have not been altered by proteolysis and they contain amino acids and polypeptides of low molecular weight. Other types are products of a total acid hydrolysis of proteins with added tryptophan. The nutritive value of these diverse products is the same, but they are administered differently. The preparations of enzymatic origin are administered by mouth in a 5 per cent solution which also contains from 7.5 to 10 per cent of dextrose. The taste of such mixtures must be masked by citric acid. They are ingested in small quantities or are introduced into the stomach by nasal tube. When the acid hydrolysates with added tryptophan are administered by the intravenous or subcutaneous route, a well trained personnel is required, for patients must be carefully supervised because of the danger of thrombosis or violent febrile reactions. Satisfactory results were obtained with this treatment during the famine in Bengal in 1943 and also in many cases of severe hypoproteinemia among those liberated from German internment camps. Patients with extensive burns, children with athrepsia, patients in surgical shock or those with nitrogen deficiencies of various toxic or infectious origins benefit from the intravenous or subcutaneous injection of protein hydrolysates.

Acta Chirurgica Scandinavica, Stockholm

92:199-290 (May 31) 1945. **Partial Index**

*Volvulus Caeci. A. Jakobsen.—p. 199.
Intradural Situation of Disk Prolapse. O. Hultén.—p. 228.
Lymphadenitis of Mesentery in Children and Young People in Light of Bacteriologic and Pathologicoanatomic Examinations of 100 Cases Treated by Appendectomy. E. E. Vuori.—p. 231.
Late Results in Nonoperative Cases of Malleolar Fractures: III. Fractures by Supination Together with Survey of Late Results in Nonoperatively Treated Malleolar Fractures. R. Magnusson.—p. 259.
Pneumoperitoneum Treated with Puncture and Injection of Sulfathiazole: Report of 1 Case. A. Zacho.—p. 278.
Observations on Cause and Social Significance of Ulcers of Legs. Å. Nilzén.—p. 285.

Cecal Volvulus.—Jakobsen in recent years has noted a pronounced increase in the number of cases of cecal volvulus in the surgical department of Ulleval Hospital in Oslo. The direct cause of this increased incidence may be found in the diet during the rationing of food in Norway. Coarser and darker bread, large quantities of kohlrabi and potatoes leave much residue and produce more gas. Various degrees of intestinal atony may result. In addition there may occur a reduction of the fat content in the mesenteries, a natural consequence of the general emaciation. The 5 cases reported showed a mesenterium ileocolicum commune. This anomaly is a necessary condition for the occurrence of cecal volvulus. The patients were 10, 13, 20, 30 and 80 years of age respectively. There were 3 male and 2 female patients. Diagnosis may be made by roentgenogram. Treatment consists in detorsion, emptying of the bowel through an intestinal tube inserted into the rectum, and fixation of the cecum in cases in which the bowel is not damaged. Resection in two stages, or sometimes in one stage, with ileotransversostomy is to be performed in cases in which the intestine is damaged.

Book Notices

Pulmonary Tuberculosis in the Adult: Its Fundamental Aspects. By Max Pinner, M.D. Chief, Division of Pulmonary Diseases, Montefiore Hospital for Chronic Diseases, New York. Fabrikold. Price, $7.50. Pp. 579, with illustrations. Springfield, Ill.: Charles C Thomas, 1945.

In this book the author set out to demonstrate that it is possible for one writer to cover "in toto" the subject of pulmonary tuberculosis adequately and consistently. He contends that existing textbooks written by one author are inadequate in covering the theoretical aspects, while textbooks written by several authors lack consistency of presentation of the various phases of the subject. As a one author book it is an eminent success. To assemble it Dr. Pinner has made ample use of his command of the literature, his erudition and his gift for skilful presentation. The result is an excellent reference book on pulmonary tuberculosis. The book addresses itself chiefly to tuberculosis specialists. By inference these are mostly in need of instruction in what Pinner considers to be the fundamental aspects of their specialty. This instruction is given to them in this book of 550 pages, of which 350 deal with the pathology, immunology, pathogenesis, epidemiology and the physiologic implications of pulmonary tuberculosis. Of the remaining 200 pages, 60 are taken up by reviews of an imposing amount of literature. This leaves 150 pages to be devoted to the clinical phases of pulmonary tuberculosis, including its treatment. Most of the chapters are finished essays on their respective phases of the subject. They are so well rounded and concise presentations that they might well be published as separate essays. The author's preferences, individual inclinations and preoccupation are revealed in the size of these essays. Judging from the extent of the first few chapters, it would seem that the enterprise began as a presentation of the theoretical phases of pulmonary tuberculosis. Then a brief outline of the clinical aspects was added to complete the work. A discussion of the epidemiologic problems was attached to the end in what appears almost as an afterthought. Finally, much space was filled in between the chapters by the invention of a new feature, namely epigrammatic reviews of relevant literature. The book is thus made up of a collection of essays assembled in logical order to cover the whole subject. Every chapter is replete with data imparting a wealth of theoretical and factual knowledge. A large measure of consistency has been achieved throughout by carrying forward the author's favorite ideas with great skill.

The least that can be said of this work is that it represents an excellent exposition of the state of our knowledge of and concepts about pulmonary tuberculosis at this time. As such it was well worth the author's effort. Students of the disease will welcome the convenience of having assembled in this concise little volume a regular reference book to all phases of the subject. The general medical reader must find the volume top-heavy with theory, affording but a small bird's eye view of the vast complexity of pulmonary tuberculosis as seen in clinical practice. The tuberculosis specialist too must question the term "fundamental" as applied to the immunologic, pathogenic and epidemiologic theories, particularly in the case of pulmonary tuberculosis. The most one can say is that it behooves every tuberculosis specialist to be familiar with our current ideas of the theoretical aspects of tuberculosis even though these are still in such a nebulous state as to have little if any bearing on our clinical thinking, let alone on the treatment of the disease. Even many of the older and newer concepts of the pathology never had the same bearing on the clinical interpretation in pulmonary tuberculosis as in other disease. For example, the pathologic theories which interpret Boeck sarcoid as a noncaseating form of tuberculosis has little bearing on the clinical evaluation of this elusive disease. Unfortunately, it is still true that a good practical textbook can be written on clinical pulmonary tuberculosis without consideration of the immunologic, pathogenic or epidemiologic theories.

On the whole, the book is probably the best of its kind published so far in the English language. Its success should be assured.

New Directions in Psychology: Toward Individual Happiness and Social Progress. By Samuel Lowy, M.D. Introduction by Herbert Read. Cloth. Price, $3. Pp. 194. New York: Emerson Books, Inc., 1945.

The author is a psychoanalyst practicing in England but originating in Czechoslovakia. He presents for lay people an application of psychoanalysis to social problems and terms the result a new social psychology. He does an excellent job of interpreting his technical knowledge and applying it to larger groups. The book is well written and interesting. However, the author has a peculiar propensity of using the abstract term "the state" as if it were an organization apart from "the people." To one familiar with Europeans it is apparent that the state means to the author something different than government means to Americans. He analyzes the neuroses gratified in members of the government of an authoritative state and the neuroses of those who willingly subjugate themselves to such a state and warns of the inherent dangers. He also believes that human weaklings must be guided and compelled by the state. One gets the impression that the author intellectually decries authoritative society but leans to it emotionally. The reviewer believes that understanding the emotional lives of sick individual persons does not help in analyzing a sick society.

The Management of the Mind. By Milton Harrington, M.D. Edited from posthumous manuscripts and notes by Ralph B. Winn, Ph.D. Cloth. Price, $3. Pp. 200. New York: Philosophical Library, 1945.

The author, who died in 1942, was a psychiatrist who held many positions during his lifetime and wrote "Wish Hunting in the Unconscious" and "The Biological Approach to the Problem of Abnormal Behavior." His widow and friends felt that the manuscript notes of this book should be edited and published as a memorial to his struggles and labors for a more scientific psychiatry. Under such circumstances a reviewer should be willing to overlook much for the sake of those who have idealized the author. But this he cannot honestly do. The contents are unscientific, consisting largely of musts, shoulds and must nots as directions to lay people who would understand themselves. There is no indication of any understanding of modern dynamic psychiatry or of the use of psychotherapy adapted to the treatment of mental or emotional disturbances. There is more criticism of others than constructive effort.

The Eternal Ones of the Dream: A Psychoanalytic Interpretation of Australian Myth and Ritual. By Géza Róheim, Ph.D. Cloth. Price, $4.50. Pp. 270, with illustrations. New York: International Universities Press, 1945.

This book is intended for anthropologists rather than for physicians. It contains great quantities of technical empirical details concerning primitive Australian culture. The author concludes: "Totemism as a social institution is a defense organized against the separation anxiety. . . . It represents our efforts to deal with the problem of growing up, aided by the illusion of an eternal future. In the eternal ones of the dream it is we who deny decay and aggression and object loss and who guard eternal youth and reunion with the mother. The old and decrepit men of the tribe become young and glorious once more." The book is intended for specialists rather than for the casually interested reader.

Needle in a Haystack: The Exciting Adventures of a Federal Narcotic Agent. By William J. Spillard as told to Pence James. Cloth. Price, $2.50. Pp. 193, with illustrations by Brinton Turkle. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1945.

William Spillard was a narcotic agent working out of the Chicago office of the Federal Narcotics Bureau, whose experiences led him into many contacts with criminal members of the medical profession who profited by violating the antinarcotic laws. He also had a great deal of experience with pedlers and addicts all over the country. With the aid of Pence James this experience has been made not only interesting but at times even amusing in its recounting.

Thy Health Shall Spring Forth: Readings in Religion and Health. By Russell L. Dicks. Cloth. Price, $1.25. Pp. 61. New York: Macmillan Company, 1945.

The chaplain of Wesley Memorial Hospital in Chicago presents here prayers and poems which have been helpful and stimulating to patients in the hospital. It is a book to give courage to people who are in the process of regaining health.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DDT POISONING

To the Editor:—Approximately three weeks ago I had all the symptoms of hay fever, that is, swelling of the turbinates, profuse rhinorrhea and slight itching of the conjunctiva. The symptoms were most pronounced at night and disappeared during the day when I was at my office. A smear of the nasal secretion showed 12 per cent eosinophils. The blood smear showed 10 per cent eosinophils and a total white blood cell count of 13,000. The daily mouth temperature never exceeded 99 F. Having had no previous history of hay fever or other allergies, I was surprised at the sudden onset. A friend who heard me say that I had started using DDT spray at about the same time suggested that I try a patch test. This was positive, with erythema and a raised border, but no actual vesicles were seen. The erythema lasted for three days. The problem at present is how to desensitize myself and how to decontaminate the household. Any help you can give me will be appreciated

M.D., Texas.

To the Editor:—A man aged 54 suddenly had an attack of symptoms similar to those of insulin shock. He said that he felt himself going to pieces, feeling weak about the middle of his body, as though his shoulders were separated from his pelvis by an empty space, and with a subjective feeling of confusion rather than dizziness. I saw him two hours after the onset of his symptoms, during which time he had taken a glass of orange juice and some hot chocolate, with no alleviation. Also during this time he had taken care of a customer, lifting a heavy package and then taking a walk around the block to get fresh air. He said he used his will power to overcome his symptoms. The symptoms continued for several hours longer. There were no gastrointestinal symptoms. Fluoroscopic examination of the chest and taking of the pulse, an electrocardiogram and the blood pressure gave normal findings. The temperature was 97 F. In spite of his symptoms he was able to run up stairs in a lively manner. There was nothing in his food habits or other conditions of the past week which might account for the symptoms except that three days prior to the attack he had done a lot of spraying with a kerosene 5 per cent solution of DDT in a small room. His symptoms abated about eight hours after onset with no medication. On the following day he took his usual walk of several miles with his usual vigor and enjoyment and with no untoward results. Is this a case of DDT poisoning?

M.D., New York.

ANSWER.—1. Pure DDT (2,2 bis(p-chlorophenyl) 1,1,1 trichloroethane) does not cause irritation of the skin in either animals or man, nor is there definite evidence of a sensitizing effect on the skin or of production of other allergic manifestations such as asthma. However, certain solvents used in the preparation of DDT mists, sprays and aerosols are in themselves skin irritants if there is sufficient exposure. In addition, it should be pointed out that contamination of the skin with some of these solvents may cause such symptoms as paresthesias and anesthesias. The vapors of the solvents on inhalation, owing to their property of causing irritation of the mucous membranes, may cause the onset of asthmatic symptoms in a person who is asthmatic. The usually used 5 per cent DDT-95 per cent kerosene spray is a primary skin irritant, because of the kerosene. Therefore one would expect a positive patch test. Individuals vary in their skin reaction to kerosene; since this is not a sensitization phenomenon but a straight irritant action, desensitization need not be considered. As a rule the kerosene or other solvent used in the DDT insecticidal spray will evaporate from the surfaces sprayed after a period of a few weeks.

2. This is not a case of DDT poisoning. Although no cases of proved DDT poisoning in human beings apparently have occurred in the United States, it is probable that the same toxicologic picture as seen in animal experiments should prevail in human cases of DDT poisoning. The symptomatology of animals suffering from DDT poisoning is characterized by hyperexcitability, nervousness, generalized tremors, the clonic-tonic type of convulsions and coma, usually ending in death. These symptoms become manifest a few hours after exposure. The major exposure when using a 5 per cent DDT-95 per cent kerosene spray in an enclosed space is to the kerosene droplets and vapor. Any solvent suitable for dissolving DDT, which is very insoluble in water, is liable to cause irritation of the skin as a result of the same physicochemical properties which render it valuable as a DDT solvent. For the same reason they may cause irritation of the mucous membranes and in sufficient concentrations may cause systemic effects, such as nausea, vomiting, fatigue, headache and other nervous system manifestations. These symptoms usually become manifest very soon after exposure, and since the symptoms in the case cited occurred three days after exposure, it is further evidence that the spray which contained DDT was not the cause of the symptoms.

DIAGNOSIS OF UNDULANT FEVER

To the Editor:—This state has recently passed a law making undulant fever compensable as an industrial disease. There seems to be a good deal of confusion among doctors and in the literature as to how a diagnosis of undulant fever can be legally established. I realize that a positive blood culture will definitely establish the disease. The blood culture, however, is often negative even if repeated tests are taken. How reliable may agglutination tests be regarded? If an agglutination test is negative three weeks after the onset of illness, is it possible for the disease to still be undulant fever? How is an atypical agglutination of 1:50 or less to be regarded in the presence of clinical symptoms of the disease? Furthermore, how may an atypical agglutination of this titer be regarded in the absence of symptoms or in a routine check-up of a patient? A skin test is often positive in the presence of a negative agglutination test; may this be regarded as a positive diagnosis or just an indication that the disease may be undulant fever? The opsonocytophagic test is not always available.

M.D., Minnesota.

ANSWER.—In the absence of positive cultures the diagnosis of brucellosis cannot be established on either clinical criteria alone or on laboratory findings alone. All noncultural laboratory tests, if positive, must be interpreted only to the extent that a positive tuberculin test in an adult is interpreted: that at some past time the person has reacted to Brucella or derivatives. Therefore the diagnosis of existing disease depends on positive tests in conjunction with symptoms and signs that are compatible with brucellosis plus, preferably, historical evidence of exposure to this infection. Asymptomatic persons with positive tests who have never had previous injections of Brucella materials in any form have probably had the disease at some previous time. The disease may have been recognized or not, and it may have been wholly subclinical or inapparent. The reliabilities of the noncultural tests are fairly well known. They vary in relation to the stage of the disease at which they are applied. Agglutination tests are most reliable in the acute febrile stage, but even here they fail in about 10 per cent of cases. In subacute or chronic brucellosis positive agglutination tests occur in about 50 per cent of cases and the titers are usually 1:80 or lower. Opsonocytophagic tests give about 3 per cent of falsely negative reactions in either the acute or chronic forms. Brucellergen intradermal tests give about 10 per cent falsely negative reactions during the initial febrile stages and are slightly more reliable in the chronic disease. Diagnostic difficulties will become fewer if all three noncultural tests are applied in proper order to all persons suspected of having brucellosis, and especially if and when emphasis is placed not on this or that test or its degree of positivity but on test results considered in conjunction with clinical and epidemiologic findings.

TRANSMISSION OF TUBERCULOSIS FROM MOTHER TO INFANT

To the Editor:—Is it possible for a baby to contract tuberculosis from nursing its mother by milk alone?

L. H. Brevard, M.D., Deeson, Miss.

ANSWER.—Tubercle bacilli in the milk is a rarity except when the mammary glands become tuberculous. Although they have been reported in the milk in the absence of demonstrable lesions of the mammary glands, in most instances there is no evidence that it was expressed under septic precautions. Moreover, there is always the possibility of tuberculous lesions existing in the mammary glands which cannot be detected by the usual examination. Although the mammary gland is not a common site for the development of tuberculosis, a good many unmistakable cases have been reported. Because of the prevalence of the bovine type of tubercle bacilli formerly reported in cow's milk, it was thought that these organisms were excreted by the mammary gland. However, later investigations revealed that the source of contamination was feces containing tubercle bacilli on the surface of the udder, which caused the contamination during the process of milking. In some instances the mammary gland itself was found to be tuberculous, and tubercle bacilli were eliminated through the milk.

From 5 to 10 per cent of the persons with advanced tuberculosis may have tubercle bacilli recovered from the blood stream on a single examination, and it is probable that 95 per cent of them have occasional showers of tubercle bacilli into the blood stream. However, the child of the tuberculous mother is well protected against them. They probably never enter the circulation of the fetus except when the placenta becomes tuberculous or some other disease breaks down its barrier effect. Moreover, tubercle bacilli in the blood stream do not enter the mother's milk except when lesions exist in the mammary gland itself. Despite the fact that the milk of a tuberculous mother whose mammary glands are normal does not contain tubercle bacilli, it is almost impossible for such a mother whose sputum is positive for tubercle bacilli to nurse her infant without causing infection.

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